The Content and Nature of Thought

A Semantic Relationist Approach to Language and the Mind

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Abstract

The thesis evaluates the potential of Fine's Semantic Relationism for a cognitivist approach to language and the mind. The main aim is to champion Semantic Relationism as the only adequate theory of content for the Language of Thought by bringing out the benefits of the theory over its main rivals, Referentialism and Fregeanism. It seeks to show that only Semantic Relationism can address all the variants of Frege's Puzzle for the Language of Thought, and that it can do so in a way that avoids the substantial difficulties that beset other semantic theories. The main outcome is at the same time a vindication of the adopted semantic theory and a confirmation of the viability of the Language of Thought hypothesis.

The thesis also offers a new theory of propositions on the basis of the Language of Thought and a Relationist semantics that differs significantly from all such presently available theories, including Fine's. The final result is a theory of propositions as syntactically structured mental representations, which are sentences in the Language of Thought, that are content bearers individuated by their semantic content as specified by Semantic Relationism. A major objective of the thesis is to highlight the advantages of this view over both classical and current alternatives.

The thesis develops its overall view by offering solutions in three closely related ongoing debates. First, the challenge posed by Frege's Puzzle for thought and belief, Kripke's Puzzle notably included, secondly, the problem about the proper type-individuation of Language of Thought symbol tokens, and thirdly, the debate about the ontological nature of concepts and propositions. By developing a promising Relationist response to these problems, the thesis also provides additional support to Fine's semantic theory by considerably expanding its scope of application.

Abstrakt

Die Dissertation prüft das Potential von Fines Semantischem Relationismus für einen kognivistischen Ansatz der Sprache und des Geistes. Hauptziel ist es, den Semantischen Relationismus als einzig angemessene Inhalstheorie für die Gedankensprache zu verteidigen, indem die Vorzüge gegenüber den wichtigsten Alternativen, dem Referentialismus und dem Fregeanismus, aufgezeigt werden. Die Arbeit soll zeigen, dass nur der Semantische Relatinismus alle Varianten des Frege Puzzles für die Gedankensprache lösen kann, und zwar in einer Weise, die die erheblichen Schwierigkeiten der alternativen Theorien umgeht. Das Ergebnis ist sowohl eine Verteidigung des Sematischen Relationismus als auch eine Bestätigung der Tragbarkeit der Hypothese einer Gedankensprache.

Auf Basis der Gedankensprache und einer relationistischen Semantik stellt die Arbeit zudem eine neue Theorie der Propositionen vor, die sich erheblich von allen bestehenden Alternativen, inbegriffen der von Fine, unterscheidet. Das Endergebnis ist eine Auffassung von Propositionen als syntaktisch strukturierten mentalen Repräsentationen, die Sätze in der Gedankensprache darstellen, sowie Träger von Inhalten, die durch ihren semantischen Inhalt typindividuiert sind. Ein Kernziel der Arbeit ist es, die Vorteile dieser Auffassung gegenüber klassischen und modernen Alternativen aufzuzeigen.

Die Arbeit entwickelt ihr Gesamtergebnis durch die Aufarbeitung von drei aktuellen, eng miteinander verbundenen Debatten. Erstens, das Problem, dass Freges Puzzle für Gedanken und Überzegungen darstellt, insbesondere in Form von Kripkes Puzzle. Zweitens, das Problem der Typindividuierung

von Symbolen in der Gedankensprache. Drittens, die Debatte um die Ontologie von Begriffen und Propositionen. Indem eine vielversprechende relationistische Lösung in diesen Problembereichen entwickelt wird, bietet die Arbeit zusätzliche Bestätigung für Fines semantische Theorie durch eine erhebliche Erweiterung ihres Anwendungsbereichs.

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Contents

Introduction

The thesis seeks to accomplish three main objectives. First, to develop an improved version of Semantic Relationism, secondly, to establish that it exclusively represents a viable theory of content for the Language of Thought, and thirdly, to present a plausible theory of concepts and propositions on the basis of the Language of Thought and a Relationist semantics. While the thesis presents new ideas in all three domains, its truly innovative contribution consists in the way they are combined. The thesis offers a novel theory of propositions as sentences in the Language of Thought that are individuated by their Relationist semantic content.

What is the wider importance of this research project? To begin with, the Language of Thought hypothesis constitutes a key foundational principle for the scientific study of language and the mind. According to the Language of Thought hypothesis, which is an empirical hypothesis about the mind closely associated with the philosophical work of Fodor, cognitive processes take place in a system of symbolic representations with semantic content and a combinatorial syntax. The semantics of the Language in Thought is in turn fundamental to account for the representational character of the mind. There is, however, a major obstacle to the viability of the Language of Thought hypothesis, which can be referred to as a type-identity problem. The basic difficulty is to determine in a theoretically systematic way when and why individual Language of Thought symbol tokens are to count as type-identical in the theory. A special difficulty in this regard is posed by Frege's Puzzle, a long-standing philosophical problem about the difference in content between co-referential expressions, as it raises the question whether all co-referential Language of Thought symbol tokens are type-identical, and if not, how they are to be distinguished. Linked to this issue are broader theoretical concerns about the notion of mental content, which impacts a variety of research projects in fields ranging from linguistics to psychology and cognitive science. Accordingly, a major aim in this thesis is to provide a comprehensive solution to the Language of Thought type-identity problem as caused by Frege's Puzzle. To do so, the thesis explains under what conditions the problem occurs, why it has to be solved, what solutions have been proposed so far and why they are not convincing. The thesis then argues that the problem can only be solved by means of the novel Relationist approach to semantic theory developed by Fine. The ulterior motive of solving the type-identity problem is to reestablish the viability of the Language of Thought hypothesis as a potential empirical hypothesis about how the mind works. To be sure, the truth of the hypothesis is ultimately a matter of further empirical research. The goal of the thesis is therefore limited to demonstrating the theoretical soundness of the hypothesis, which is necessary for its status as a serious theoretical contender in the study of the mind. After all, the significant explanatory potential of the conjecture that mental processes are symbolic, especially in view of currently available alternatives such as connectionism, makes a plausible case for the

assumption that at least part of the mind has to be explained by appealing to mental structures with syntactic and semantic properties realized in the brain.

A second topic of scientific interest is the nature of semantic content. The fundamental question in this regard is what exactly semantic content consists in, which is a question that evidently affects core issues in the philosophy of language and mind. While it is generally accepted that a relation of reference between linguistic expressions and extra-linguistic entities is part of the notion of semantic content, a highly disputed issue is whether anything more has to be included as well, and if so, what. As a result, the philosophical literature is characterized by a dispute between Referentialists, who claim that semantic content consists exclusively in reference, and philosophers inspired by the philosophical work of Frege as well as proponents of various other, more holistic approaches to the nature of semantic content. There is thus a major ongoing dispute as to which semantic theory adequately describes the nature of semantic content. Since this dispute clearly depends on very foundational issues, for instance regarding the ontological status of languages, the thesis addresses this debate in the specific context of the Language of Thought hypothesis. The main resulting question is which semantic theory provides a notion of semantic content that is adequate for the Language of Thought. The thesis ultimately defends the claim that only Semantic Relationism, a semantic theory recently developed by Fine, qualifies. To this end, the thesis describes the basic tenets of a Relationist semantics, puts the theory into a broader historical context and explores its explanatory potential. The main goal is to show that a Relationist approach to semantics makes it possible to finally and definitely solve Frege's Puzzle as it arises in the context of propositional attitudes. To the very least, this represents a corrective measure regarding the deplorable fact that Semantic Relationism is still largely ignored in many important contemporary debates, much to the detriment of the prospects of settling them. While the Language of Thought type-identity problem is a good case in point, there are further topics as well, some of which are also discussed in the thesis, if only briefly.

A third crucial topic is the theory of propositions. Ever since the seminal work of philosophers such as Frege and Russell, propositions are unquestionably of great importance for many contemporary philosophical subjects. Propositions are for instance pivotal for current debates in the philosophy of language in their roles as the complex contents of natural language sentences, but also in the philosophy of mind as the objects of mental attitudes. Propositions are furthermore linked to many other philosophically significant concepts such as truth and modality. It is therefore hard to overstate the philosophical importance of propositions for topics as diverse as language, the mind, logic and mathematics. In terms of propositions, many if not most contemporary theorists still adhere to a classical understanding of propositions, with Russell's object-containing conception in particular being very common. Recently, however, there has been a renewed focus on the difficulties that beset classical accounts, due in no small part to the philosophical work of King, which has lead to the development of several new alternative proposals about the nature of propositions. In the context of this debate, the thesis proposes a new approach that takes propositions to be mental representations and bearers of semantic content, instead of assuming, as most classical and recent accounts do, that they are content entities.

The three main topics under discussion are the Language of Thought hypothesis, semantic content and propositions. How are these topics related in the thesis? This question is actually crucial as a major motivation for the thesis is that while the view defended in each of the three topics is individ-

ually plausible, it is even more important that the different views - about how the mind works, what mental content consists in and what propositions are - are mutually supportive. How so? First of all, Semantic Relationism provides the adequate theory of content for the Language of Thought. The Language of Thought in turn represents the right basis for a semantic theory. It constitutes the right object for a Relationist semantic theory as it enables a comprehensible and convincing account regarding the nature and plausibility of the notions posited in a Relationist semantics. Finally, both together provide the foundation for a plausible alternative conception of propositions. While the Language of Thought supplies the objects taken to be propositions, the Relationist semantics allows for their proper individuation. That way, the proposed theory of propositions as syntactically structured mental representations depends crucially on a Relationist semantics and a Language of Thought based approach to the mind. In short, Semantic Relationism makes the Language of Thought hypothesis viable, which in turn renders Semantic Relationism convincing, and combined they provide the tools necessary for a promising new theory of propositions. That way, the three main topics of the thesis are closely interconnected.

Because of the interconnectedness between the major topics, the plausibility of each core idea defended in this thesis originates from two sources. On the one hand, it is derived from arguments that demonstrate the independent plausibility of the idea. On the other hand, it is also derived from the plausibility of the overall proposal in which the idea plays a crucial role. Hence, while it is evidently necessary to assess the merits of each proposed idea in view of possible alternatives, it is also essential to keep in mind their connection to other ideas as well as their contribution to the proposal and its plausibility as a whole. This is all the more important given that it is obvious that, due to the vast scope of the thesis, it is impossible to comprehensively defend each claim against all the alternative options available in the literature. At any rate, the thesis makes a conscious effort to focus in each case on the most prominent and promising alternatives, while at the same time making undefended assumptions and omitted alternatives, both of which are inevitable to a certain degree, as clear as possible. That way, the overall proposal is not the result of a series of closely linked and irrefutable steps, as in a mathematical proof. Rather, some individual steps rely at least partly on their intuitive plausibility and their contribution to the plausibility of proposed account as a whole. In this regard, any research project faces a trade-off. Whereas research with a very narrow focus is able to study a limited topic very comprehensively and in the minutest detail, research with a broader scope is necessarily more general. This thesis is predicated on the idea that neither approach is preferable as such, as both are scientifically useful and legitimate. With this in mind, the thesis focuses on a broader subject area, justified by a sense that questions in one area cannot be adequately settled without considering their impact on related areas. To give an example, the claim that Semantic Relationism is the preferable semantic theory is not only based on arguments that it best solves Frege's Puzzle, but also on the point that it is ideal as a theory of content for the Language of Thought and that it enables a promising theory of propositions as mental representations.

At this point a few caveats are in order. In view of the ample scope of the thesis, it is manifestly impossible to describe, let alone discuss, all the significant contributions made in the areas relevant for the thesis, be it Frege's Puzzle, the Language of Thought hypothesis or the theory of concepts and propositions. There is simply too much work on these topics, so that some preliminary selection is unavoidable. As a matter of general strategy, an attempt has been made to focus on recent papers,

papers that are directly and fully relevant, and papers of seminal importance, which is of course to a certain extent a matter of opinion. Also, it is often unavoidable to select one author to represent others who defend broadly similar views. As a result, differences in detail between authors vital to the authors themselves have to be ignored at times, but that is no reason to lose sight of the common basis shared by these authors at which criticism can be appropriately leveled.

It also unfortunate that despite of the comprehensive scope, many issues important enough to warrant further research have to be left out. A general example is the potential impact of the current proposal on the dispute between internalism and externalism in the philosophy of language. Another instance of this is the potential impact of the proposal on the debate on the causal efficacy of content. A more specific example is the relation between the alternative conception of propositions developed in this thesis and Fine's recent ideas on this topic, especially Fine's work on what he calls tertiary content. And even for many topics that are included without being focal, the profound implications of the proposed view are often sketched only very briefly. In fact, a Relationist semantics and a theory of propositions as mental representations clearly have ramifications for a great many subjects in the philosophy of language and mind and beyond, most of which cannot be included in the thesis for lack of space. Evidently, this does mean that these subjects are considered less important.

Before offering an outline of the thesis, a personal note on how I chose the topic. Although I wrote my master thesis on Semantic Relationism in comparison to Fregeanism and Referentialism, I decided to focus for my thesis on concepts instead. I was particularly interested in the theory of concepts of historically and systematically influential philosophers, most notably Kant's conception of concepts as rules for thought, Frege's idea of concepts as abstract senses and Fodor's view of concepts as mental representations. These seminal yet very diverse approaches to concepts raised an obvious question for me about the true nature of concepts. I was particularly taken with the modern idea that concepts are mental representations, which, embedded in the Language of Thought hypothesis, is part of a broader computational and representational theory of mind that holds great promise for explaining how mental phenomena can occur in a world governed by the principles of physics. This is evidently why such a theory of concepts is very prominent in contemporary research in philosophy as well as linguistics, psychology and cognitive science. Hence, I decided to study Fodor's contribution to the topic in more detail, and in doing so, I learned quickly about a very fundamental problem the theory has in terms of providing a proper criterion for the type-identity of concept tokens, which is a problem so serious that by Fodor's own admission it threatens the overall Language of Thought hypothesis. I also realized quite soon that Fodor's own response to the problem is unsatisfactory, and that no other semantic theory applied to the problem so far could solve the problem either, as it would always be possible to come up with a case for which the specific proposal would fail to give a response, or even worse, give the wrong response. This inevitably made me recall Semantic Relationism, a theory not widely known at the time, and which, crucially, had not yet been considered for solving the type-identity problem. I convinced myself that Fine's little known semantic theory indeed represented a promising candidate for solving a substantial problem affecting a hypothesis of great scientific importance, and that explains the topic of the thesis. And not only did I see an opportunity to solve a substantial theoretical problem, I also saw it as a chance to have philosophy do what in my view it does best, namely to clarify the fundamental theoretical concepts of theories that are crucial for other branches of science. Midway

through my research, I also realized that the combination of the Language of Thought hypothesis and a Relationist semantics allows for a very different approach to propositions, which looked more plausible to me than some of the alternatives developed at the time, according to which propositions are acts, events or even facts. I therefore decided to focus on this issue during my stay as a visiting research student in New York. And while I realized early on that I would not have enough time to fully elaborate and defend the proposed conception of propositions, I seemed nonetheless promising enough to me to justify inclusion in the thesis, especially in view of the philosophical importance of propositions and the many difficulties faced by the alternative proposals in the literature, both classical and contemporary.

Finally, a brief outline of thesis. In the first and rather long chapter, the thesis starts with a brief introduction to Frege's Puzzle and a discussion of several semantic theories that contain proto-Relationist ideas, which serves as a historical background to make Fine's Semantic Relationism more accessible. The second chapter provides a systematic introduction to Semantic Relationism, with a focus on the aspects of the theory relevant for Frege's Puzzle for the Language of Thought. Among other things, the crucial notion of semantic coordination is explained. The chapter also highlights the differences between the Relationist semantics adopted in this thesis and the version advocated by Fine. The third chapter first introduces the Language of Thought hypothesis as presented by Fodor. Subsequently, the connections between the Language of Thought hypothesis and more comprehensive theories about mental capacities and processes, most notably linguistic competence and rational behavior, are explained. Finally, the chapter describes the major difficulty Frege's Puzzle represents for the viability of the Language of Thought hypothesis. The fourth chapter makes the connection between the Language of Thought hypothesis and the theory of belief, and specifically between Frege's Puzzle for the Language of Thought and Kripke's Puzzle about belief. It then briefly considers and rejects pragmatic strategies to solve Frege's Puzzle, which leaves semantic and syntactic approaches as remaining options. As a final point, it discusses the role of propositions for Frege's Puzzle for belief. The fifth chapter then finally focuses on Frege's Puzzle for the Language of Thought, which arises as the type-identity problem for Language of Thought symbol tokens. The basic problem is described, followed by a negative assessment of the proposals Fodor has made to address it in an attempt to defend Referentialism. A similar assessment is offered for other Referentialist proposals in the literature. Subsequently, the chapter looks into the possibility of applying a Fregean semantics to the Language of Thought. This idea is also rejected, however, because of several problems that arise for the Fregean response to the Puzzle, most notably its inability to address Kripke's version of the Puzzle, as is shown by a case specifically developed for this purpose on the basis of prior examples derived from Kripke and Fine.

The interim result after the fifth chapter is that Frege's Puzzle constitutes a substantial problem for the viability of the Language of Thought hypothesis that no semantic theory considered up to that point is able to solve. This motivates the goal in the sixth chapter of developing a Relationist semantics for the Language of Thought, with a focus on the key Relationist notion of semantic coordination. The first part of the chapter explains the difference between intrasubjective and intersubjective coordination and describes how coordination is metaphysically grounded in different ways. The second part then shows how the proposal can solve the cases that are problematic for the alternative semantic theories. Finally, the chapter briefly points out some broader consequences of the fact that the Language of Thought has a Relationist semantics, which implies that notions

such as mental content and the content of belief are Relationist as well. The basic objective in the seventh and final chapter is first to emphasize that the outcome of the thesis so far supports a conception of concepts as mental representations. After that, a new approach to propositions along the same lines is developed. On the proposed view, propositions are mental representations that are bearers of content which have semantic content as a property. It is argued that propositions so understood are able play the roles generally accorded to propositions, and that the view has substantial advantages over more traditional conceptions of propositions as well as the more radical alternatives recently proposed in the literature.

Chapter 1

Historical Introduction to Semantic Relationism

1.1 Frege's Puzzle and Frege's Sense Theory

1.1.1 Introductory Remarks

The ultimate aim of this chapter is to provide the background necessary to make sense of Semantic Relationism, a novel semantic theory developed by Fine in response to Frege's Puzzle, which is discussed in detail in the next chapter (Fine 2009). For this purpose, the chapter first introduces Frege's Puzzle and the theory Frege proposes to solve it. Subsequently, it presents several approaches with similar Relationist ideas in the literature. In his review of Semantic Relationism, Ostertag makes the following observation about Fine's contribution:

> "The discussion is conducted at a very abstract level. Moreover, allusions to moves in the literature are not always flagged; even when they are, the relevant views often receive cursory treatment. This is unfortunate. Articulating a theory is often not enough - it is also important to locate it within the space of other, similar proposals."
> (Ostertag 2009: 349)

This introductory chapter is an attempt to at least partly redress this concern.

The chapter does not, by any means, attempt to provide an in-depth exposition of all the intricacies of Frege's philosophical work, only a summary of what motivated Frege's renowned theory of senses. One reason is that both Frege's Puzzle and his proposed solution represent very well-known contributions to the philosophical literature, the paramount significance of which is almost universally accepted[1]. As such, it is part of general knowledge in analytic philosophy. Moreover, there already is a wealth of secondary literature that discusses almost every aspect of Frege's work[2]. For this reason, the exegetical analysis is kept to a minimum and the aim is instead to offer a summary idea of what puzzled Frege and motivated him to develop his semantic theory. Another reason to keep this section short is that variants of Frege's Puzzle appear throughout the

[1] See Almog (2008) for a rare dissenting view on the systematic relevance of the Puzzle.
[2] See Dummet (1973, 1993), Klement (2002), Perry (1977), Sainsbury (2002), Textor (2010a), to name just a few.

thesis, and where they do, the relevant version of Puzzle is discussed extensively, with a focus on the problematic issue raised in the context at hand.

Although Frege's Puzzle appears in many different versions and contexts - in a monadic or a dyadic version, or as a puzzle for natural language sentences, for beliefs, or for the Language of Thought – a basic assumption in this thesis is that the core issue is always the same[3]. What the Puzzle ultimately highlights is that there is a substantial difference between certain linguistic expressions even if they are about the same object, which raises an obvious question as to how exactly these expressions differ. This fundamental question, which Frege was the first to ask, represents the core issue underlying all versions of Frege's Puzzle. And Frege is not only credited for being the first to draw philosophical attention to this problem, but also for providing the first potential solution to it, which has proponents to this day[4]. Yet despite the long standing philosophical interest in Frege's Puzzle as well as Frege's own efforts to solve it, many philosophers are convinced that the core problem remains unresolved to this day. They see insuperable difficulties in Frege's own proposal, as well as with the many alternatives that have been proposed since. As a result, there is still no generally accepted solution to Frege's Puzzle. In fact, there is not even a generally accepted type of solution, as there is still deep disagreement about whether the Puzzle has to be solved semantically, syntactically or pragmatically, or perhaps by a combination of some or all of these. It is also important to note that Frege's Puzzle has impeded research progress not only in philosophy, but in other research areas as well, most notably cognitive science. A major line of inquiry in cognitive science is based on the hypothesis that cognition consists in computational activity on the basis of a symbolic system of representations encoded in the brain, the so-called Language of Thought hypothesis. It turns out that Frege's Puzzle arises for the Language of Thought as well, seriously calling into question the viability of the hypothesis. These two points together show why Frege's Puzzle has to be addressed. It is a scientifically important and yet unresolved problem.

1.1.2 Linguistic Background Assumptions

This thesis adopts the classical picture of linguistic analysis that divides language into three basic levels: syntax, semantics, and pragmatics. While the exact demarcations between these levels are a topic of ongoing disputes, the division itself is widely accepted in linguistics and the philosophy of language.

On the standard view, semantics concerns the meaning or content of linguistic expressions, both simple and complex[5]. Syntax, in contrast, deals with linguistic structure independently of its

[3] For that reason, and unlike other contributions in the literature, the thesis always refers to Frege's Puzzle in the singular. It will speak of different versions or variants of the Puzzle rather than different Puzzles in the plural.

[4] See for example Peacocke (1989b), Sainsbury (2002) or Zalta (2001).

[5] A brief note on the difference between meaning and content, which are often used interchangeably in the philosophical literature. This pattern is also followed here, as it allows for a discussion of the existing literature in its own terminology, without already engaging the view on language ultimately adopted in this thesis. Later on, a stricter terminology is used. Linguistic items of natural languages such as German have meaning, while concepts, which are mental representations, have content. Semantics is ultimately a theory of content, which is to say that it directly applies only to linguistically structured mental representations. Natural languages do not have content in the strict sense, only meaning. The meaning of the German word "Hund" is its association with the concept DOG. This concept is a mental representation the content of which is the property of dog-hood. Hence, "Hund" means DOG, which in turn refers, as part of its semantic content, to the property of being a dog. Knowing the meaning of a linguistic term is knowing what concept to associate with it. It is having the ability to associate with a word the concept with the the right semantic content.

semantics. This means that syntax describes the form or structure of linguistic items to the extent that it does not appeal to their meaning or content. In a logical rather than temporal sense, syntax is pre-semantic. The following paradigm case can be used as an example:

(1) John saw a man with binoculars.

As is well-known, the sentence has two distinct readings. John either saw a man carrying binoculars or he used binoculars to see a man. This semantic difference has to be independent of the meaning or content of the basic linguistic entities (roughly, the words), which are the same for both readings[6]. The generally accepted view is that the semantic difference between the two readings is entirely due to a difference in syntactic structure. The two readings are based on sentences with different syntactic structures, which only appear to be the same on the phonological surface, which is due to a similarity in sound that is carried over into written form. This contribution of syntax to the meaning of sentences is captured in linguistic analysis by the classical tenet of compositionality. According to the principle of compositionality, the semantic content of a complex expression is a function of the semantic content of the basic expressions and their syntactic mode of combination. As a result, a syntactic difference can be semantically relevant (for complex but not basic expressions) without itself being semantic.

Pragmatic differences, in contrast, are usually considered post-semantic differences. A pragmatic difference exists roughly when two sentences (or utterances) have the same semantic content but carry different implications. The following sentence pair provides an example:

(2) The story is complex and interesting.

(3) The story is complex but interesting.

The reason for the assumption that both sentences have the same content is that they are true under exactly the same conditions, namely that the story is complex and interesting at the same time. Hence, both sentences express a logical conjunction of two properties that are attributed to an entity. Only the latter sentence, however, implies that complexity is usually to the detriment of interestingness. It implies that the story is interesting despite being complex. The former sentence carries no such implication. It is neutral on the relationship between complexity and interestingness. The sentences are thus identical in content but different in terms of what they imply about the relationship between complexity and interestingness. The point here is of course not to claim that this particular example is correctly analyzed as a pragmatic rather than a semantic difference. The aim is just to show what a pragmatic difference amounts to on the assumption that "and" and "but" have the same meaning.

1.1.3 Frege's Puzzle

With this basic linguistic picture in place, it is now possible to introduce Frege's Puzzle. In his seminal paper "On Sense and Reference", Frege starts from the intuitive idea that proper names

[6] Such cases are therefore unlike typical ambiguity cases such as "going to the bank", where "bank" can mean either the side of a river or a financial institution.

have only reference as their semantic content (Frege 1892). On the intuitive view, the sole content of a proper name is the object it names, which is the object one can speak about using that name. A proper name is then nothing more than an arbitrary, if conventional, tag for an object. This view, which has proponents to this day is, for historical reasons, called a Russellian or Millian view. An alternative name is Referentialism[7]. With this semantic conception of proper names in mind, Frege was fundamentally puzzled by two types of statements: identity statements and propositional attitude statements (Frege 1892: 25, 32)[8]. Frege uses identity statements such as the following to make his point (Frege 1892: 32):

(4) The morning star is the morning star.

(5) The morning star is the evening star.

It is important to note that in Frege's original German, "morning star" and "evening star" are real proper names, which the planet Venus shares with the German poet Christian Morgenstern and the German economist Oskar Morgenstern. This is lost in the English translation, much to the confusion of some commentators[9]. In order to sidestep this issue, it makes sense to use the following examples instead:

(6) Phosphorus is Phosphorus.

(7) Phosphorus is Hesperus.[10]

The basic mystery for Frege is how (7) can be informative while (6) is not, even though the proper names that occur at the end of both statements are names for the same object. Intuitively, the reason has to do with the fact that the identity is not obvious in the second statement, but the challenge is to account for this in linguistic terms. What, Frege wonders, is the difference between the two co-referential proper names that explains the obvious difference in informativeness between the statements that contain them?

As mentioned, Frege also notes a difficulty for the intuitive view in terms of propositional attitude statements, which are statements that have an embedded clause as the object of an attitude verb. Frege starts from the basic assumption that in normal or non-embedded contexts, true statements remain true if one proper name is substituted for a co-referential (and syntactically equivalent) alternative. The so-called principle of truth preservation under substitution of co-referential terms explains why the following two statements necessarily have the same truth value:

(8) Phosphorus is a planet.

[7] To be slightly more precise, Millianism is usually taken to be restricted to proper names, while Referentialism and Russellianism endorse the reference only view for linguistic terms more generally. The reason is evidently that Mill held this view only for proper names, while Russell was not so reserved. In this thesis, the term Referentialism is used throughout, as it highlights the systematic rather than the historical interest of the project.

[8] Interestingly, a generally shared opinion is that Frege, who was a mathematician by training, came to the philosophy of language with the sole purpose of solving linguistic problems that hindered him from doing proper foundational mathematics. The prominent role of identity statements, as well as the geometric example he uses in "On Sense and Reference" certainly corroborate this. But in the paper Frege is also interested in propositional attitude statements. Since these are hardly of mathematical relevance, it shows that at least by the time Frege wrote "On Sense and Reference", he considered language a scientific topic of interest in its own right.

[9] See for instance (Fodor 2008: 60).

[10] As a friendly reminder: Phosphorus is Venus as the morning star and Hesperus is Venus as the evening star

(9) Hesperus is a planet.

The principle holds that one statement can only be true if and only if the other is as well. The reason is obvious. If Phosphorus is in fact identical with Hesperus, then Phosphorus can only be a planet if Hesperus is as well. Since both statements predicate the same property of the same object, they can only be either both true or both false, if else the object in question would have and fail to have a given property at the same time. As imperturbable as this principle looks, Frege notes that it seems to fail in certain contexts (1892: 37):

(10) Aristotle believed that Phosphorus is Phosphorus.

(11) Aristotle believed that Phosphorus is Hesperus.

The first is true, but the second is not. Aristotle was well aware of the self-identity of objects, but he did not know that the object he could see in the sky every morning was in fact the same object as the one he could see every evening. Contrary to what the principle suggests, then, truth is apparently not preserved under the substitution of co-referential proper names in all contexts. There is something one can truly predicate of Phosphorus, namely being believed by Aristotle to be identical to Phosphorus, which cannot be truly predicated of Hesperus also, despite the fact that Phosphorus is identical with Hesperus.

Although Frege ultimately solves both problems in an analogous manner, he notes that they raise distinct issues. Identity statements puzzle Frege mainly because of the considerable difference in cognitive significance ("Erkenntniswert", perhaps more faithfully translated as epistemological value) between the co-referential identity statements. Despite describing the same state of affairs, only the second statement has epistemological value, in that one learns something interesting upon finding out that it is true. In stark contrast, the truth of the first is too obvious to be epistemologically valuable[11]. Frege thus wonders how the disparity in epistemological value can be explained. In "normal" situations, as in case of a difference between "Venus" and "Mars", one would evidently appeal to the fact that they are names for different objects, but that response is not available in the puzzling case as "Hesperus" and "Phosphorus" are co-referential. How, Frege asks, can a mere difference in arbitrary sign used to speak of an object be the basis for such a substantial difference in epistemological value?

Before presenting his new semantic idea, Frege first rejects a proposal made in earlier work. In his "Begriffsschrift", Frege advanced the intuitive claim that the epistemological difference is explicable by the mere fact that different linguistic signs are used (1964: 13-14). An identity statement is informative on this earlier proposal if different names are used for the same object. At this point, however, Frege rejects this proposal, as it would amount to reinterpreting identity as a relation between linguistic signs (1892: 25-26). The sentence "a is identical to b" would be interpreted along the lines of "sign A has the same content/reference as sign B". On this analysis, identity

[11] The possibility of empty names is set aside here. So one can assume for the sake of argument that both proper names are known to refer to something. This is important as on certain views an identity statement can only be true if the names are not empty. Hence, if there is a possibility that the names are empty, even the truth of the "obvious" identity statement would have epistemological value, as upon learning its truth one would learn the non-obvious fact that the names are not empty. This issue can be set aside here because what would be learned in that case would still be different for the obvious identity statement and its non-obvious counterpart. The difference pointed out by Frege would remain, even if it would have to characterized differently.

relates signs rather than the objects the signs stand for. If this were correct, however, Frege reasons, "Hesperus is Phosphorus" would be a statement expressing linguistic knowledge about the use of linguistic expressions. But in fact the statement expresses astronomical knowledge about the identity of a celestial body that happens to be visible at different times. Therefore, the identity relation should not be interpreted as a relation between signs, if else one cannot explain why knowing the truth of the statement that Hesperus is Phosphorus would be to acquire astronomical knowledge. Frege concludes that the difference in epistemological value cannot be explained by fact that different signs are used. Since the difference does not lie in what these signs refer to either, Frege infers that the difference must lie in how they designate their reference, which he calls a difference in the mode of determination or presentation of the object referred to by a sign.

In the case of propositional attitude statements, it is rather the difference in truth value under the substitution of co-referential terms that puzzles Frege. Frege wonders how one statement can be false while its co-referential equivalent is true, even though both predicate something of the same object. Having already rejected the explanatory relevance of the difference in linguistic sign, Frege realizes that the problem lends itself to the same solution as identity statements. At this point, it becomes apparent why the example Frege actually uses is rather ingenious. Even though "morning star" and "evening star" are real proper names in German, they clearly suggest a difference in how they designate their object. Intuitively, the morning star is the planet Venus as the "star" visible in the morning, while the "evening star" names a celestial body visible in the evening. As mentioned, this explains for Frege why the embedded identity statements have different epistemological value. While one identity statement is obviously true, the other is not. This can in turn be used to explain the difference in overall truth value. As Aristotle did not think that both names refer to the same object visible at different times, he did not believe that Phosphorus is Hesperus, but he did of course believe that Phosphorus is self-identical. The example shows for Frege that the truth of an attitude ascription is sensitive to how the object is presented to the person to which the attitude is ascribed. If one replaces the proper names by the definite descriptions they suggest, it becomes even more evident. Aristotle evidently believed that the star visible in the morning is identical to the star visible in the morning, but he did not believe that the star visible in the morning is identical to the star visible in the evening. As the actual examples contain proper names instead of descriptions, Frege adopts the same explanation for proper names, by concluding that they differ in how they present their reference. Frege concludes that co-referential proper names can differ in how they present their shared reference, and that the truth of propositional attitude statements is sensitive to such differences in modes of presentation.

The crucial next step in Frege's argument is his conjecture that the way a proper name designates its object is part of the semantic content of a name. Despite the pivotal importance of this assumption, Frege says surprisingly little about his justification for it. The best motivation Frege has for it is arguably his idea that content is objective, which makes it generally accessible and shareable within a linguistic community (1892: 50, footnote 5). This contrasts with a subjective difference between expressions, which occurs when speakers associate different things with them. The term "cilantro", for example, evokes tastiness for some, but bad taste for others. For Frege, such differences in subjective feeling have no objective basis in language, and as such, they are not part of what is communicated with the use of an expression. Subjective differences are entirely due to a speaker's extra-linguistic attitudes towards the reference of a the proper name. However, it is important

for Frege that the difference in mode of presentation between "Phosphorus" and "Hesperus" is not subjective in this sense. By making modes of presentations part of the semantic content, Frege ensures their objective status, and thus their linguistic relevance. Modes of presentations objectively attached to proper names as content are suitably independent of speakers' idiosyncratic predilections and beliefs, so that they can and in fact have to be known to all members of a linguistic community as a matter of their linguistic competence.

The main concern here is not whether sense can be made of the Fregean dichotomy between the subjective and the objective, which certainly raises an issue about their precise demarcation. The problem is that even if one accepts the dichotomy, the proposed argument is not convincing. Showing that something linguistic is objective is not enough to show that it is semantic. Presumably, the syntactic features of a language are also objective in Frege's sense, but they are not thereby semantic. It follows that the argument offered on behalf of Frege is insufficient, which means that Frege lacks a good argument for his assumption that modes of presentations have to be considered part of the semantic content of expressions. Moreover, it is clearly not unreasonable to suggest that the difference lies elsewhere, on the syntactic or pragmatic level, say. It is therefore not surprising that Frege is targeted by many for making this fundamental assumption without proper justification. That is why most alternative proposals to solve Frege's Puzzle developed since Frege are predicated precisely on rejecting this Fregean assumption. The proponents of these alternative solutions agree with Frege that there is a substantial linguistic difference between co-referential terms, but they disagree that it is semantic in nature. Instead, they claim that it is syntactic (Fodor 2008) or pragmatic (Salmon 1986).

Even if the shortcomings in Frege's argumentation are unmistakable here, this thesis still upholds Frege's assumption about the semantic nature of the difference between co-referential proper names. It adopts a version of Fine's Semantic Relationism that shares this assumption with Frege's theory of senses. Like Frege's semantic theory, Semantic Relationism also constitutes a two-tier semantic theory that posits more than reference as the semantic content of referential expressions. Even so, the thesis does not provide an argument to justify this assumption for the general case, based purely, that is, on the Puzzle as presented by Frege here, without any further background assumptions about the context in which the Puzzle occurs. Unsurprisingly, some Fregeans have attempted to do exactly that. Taschek, for instance, uses the observation that a difference in mode of presentation is relevant for the logical validity of inferences to argue that only a view on which such differences are semantic is adequate to account for this fact (Taschek 1992: 768)[12]. Another option is to make use of the concept of knowledge. A possible argument would state that the informative and the non-informative identity statements constitute different pieces of knowledge, and claim that this can only be maintained if the beliefs that underpin the knowledge differ in content[13]. In either case, the outcome of such an argument would be a general argument to the effect that the Puzzle can only be solved semantically. Such general arguments will not be pursued here, however. Instead, the thesis proposes to consider individual variants of Frege's Puzzle in specific contexts in order to show how and why the non-semantic alternatives fail. This will establish that for certain variants of the Puzzle, only a semantic solution is viable. When combined with the plausible conjecture that the puzzling issue is in fact the same for all variants of the Puzzle, it is still possible to substantiate Frege's assumption for the general case. It shows that Frege is correct that his Puzzle points to a

[12] See also the next section on Taschek.

[13] I vaguely recall Textor developing arguments along these lines.

semantic difference between co-referential proper names, which in turn entails that there is more to the content of proper names than their reference[14].

As seen, both identity statements and propositional attitude statements convince Frege that there is a difference in semantic content between co-referential proper names. This difference in semantic content explains for Frege the difference in truth value for embedded statements as well as the difference in cognitive value for identity statements. The underlying assumption that the two respective sentences differ in a linguistically significant way is certainly plausible. For example, the uninformative identity statement qualifies as a logical truth that is knowable apriori, which explains why it is not very interesting from an epistemological point of view[15]. By learning that the uninformative identity statement is true, no significant epistemological progress has been made. In stark contrast, the informative identity represents an interesting truth that had to be established on the basis of empirical evidence. As Frege points out, the truth of the statement that Phosphorus is Hesperus actually represents an important astronomical discovery (1892: 25). For propositional attitude statements, the linguistic difference is even more evident. The fact that the two statements differ in truth value shows that they say different things about the world, and assigning different semantic content to them is a way to account for this.

Having established that the respective sentences differ in content, Frege then faces the question as to how they differ in content. The classical principle of compositionality he endorses makes the semantic content of a complex expression, such as an entire sentence, a function of the semantic content of the basic expressions and the way these are put together syntactically. Since the syntactic structure of the sentences is the same the respective cases considered, he concludes that the proper names do not have the same content after all. As they do have the same reference, it follows that the content of a proper name is more than just its reference. Hence, there is more to the content of a proper name than just the object it is a name of:

> "It suggests itself to think of a sign (name, combination of words, character) as being associated other than with the designated object, which can be called the reference of the sign, also with what I would want to call the sense of the sign, in which the mode of presentation is contained."
> (Frege 1892: 26, my translation)

Frege thus thinks that senses are what distinguishes the content of co-referential proper names. Senses also account for the cognitive significance of expressions (Frege 1892: 50). It is thus possible to explain the difference in cognitive significance between the informative and the uninformative identity statements on the basis of a difference in sense. While the semantic level of reference explains why both identity statements have the same truth-conditions, the semantic level of sense explains why they nonetheless differ epistemologically. An identity statement with two sense-

[14] That said, the thesis does not really substantiate the claim that Frege's Puzzle requires a unified solution. Suffice it to say that the assumption is plausible and should therefore be the default assumption. So if there is variant of the Puzzle the proponent of an alternative solution cannot address, the onus is on him or her, first, to propose a different solution for that variant or to accept the one proposed here (which already establishes a major part of the thesis that Semantic Relationism is the preferable semantic theory) and secondly, to demonstrate that it is sensible to have different solutions, especially when (i) the initial motivation for the alternative solution was not to invoke a difference in semantic content and (ii) the semantic solution proposed here can be used to solve both variants. None of this establishes conclusively that one should opt for a unique solution to all variants of Frege's Puzzle, but given that Semantic Relationism offers such a solution, it is hard to see how the alternative can hold a lot of promise.

[15] As before, it is assumed here that the proper names are not empty, which is evidently not something knowable apriori.

identical proper names flanking the identity sign is uninformative, while a statement with two co-referential yet sense-distinct expressions is both true and informative. In the case of propositional attitude statements, Frege holds that proper names which occur in a clause that is the object of a propositional attitude predicate refer to their sense instead of their reference (Frege 1892: 37). In other words, proper names shift their reference in embedded clauses. This allows Frege to uphold the principle that the substitution of co-referential terms always leaves the truth value of a sentence unchanged, as within embedded clauses co-referential proper names are then no longer co-referential. Frege thus uses a difference in sense to ground a difference in reference in oblique contexts, which he then invokes to explain the difference in the truth value of the overall propositional attitude statements. That way, senses solve both variants of Frege's Puzzle.

However, it is crucial here to distinguish between Frege's general strategy and his specific proposals. For propositional attitudes, for instance, his general strategy is to appeal to senses as an additional element of the semantic content of proper names, while his specific proposal is have proper names refer to senses in embedded clauses. As it turns out, Frege's specific proposal to explain the difference in truth value between propositional attitude statements is highly problematic[16]. The reason is that it runs into difficulties for anaphoric expressions, which are pronouns that semantically depend on a linguistic antecedent, as the pronoun "it" in the following example:

(12) Aristotle believed that Hesperus is a star, but it actually is a planet.

The problem is that on the standard view, the anaphoric pronoun "it" is taken to inherit the reference of its antecedent[17]. Unfortunately, Frege is unable say this, as on his view the antecedent of "it", the proper name "Hesperus", refers to the sense of "Hesperus" rather than its reference, given that it occurs within an embedded clause. The most plausible linguistic theory on anaphora is thus impeded by Frege's theory, which strongly calls into question his proposed analysis of propositional attitude statements. It is also clear that Frege cannot get out of this problem by maintaining that the anaphora refers to the sense of "Hesperus" as well, as then the sentence would claim of a sense that it is a planet. In that case, the sentence should be false, while in fact it is true.

This problem has generally convinced philosophers that Frege is mistaken about the role of senses in the explanation of differences in truth value between propositional attitude statements with co-referential proper names. However, it is important to note that a Fregean can uphold Frege's general strategy without endorsing his specific explanation. As an alternative to Frege's analysis, a Fregean can maintain that in oblique contexts co-referentiality is not enough to preserve truth value under substitution. The alternative option is thus to give up the unrestricted principle of truth-preservation for co-referential terms, in which case there is not need to maintain that there is a shift in the reference of proper names in oblique contexts. Instead the claim is that in oblique

[16] See Segal (1989) and Pietroski (1996) for a comprehensive discussion.

[17] This general account leaves open the way this works cognitively as part of the linguistic competence of speakers. Although there are various options, a very promising option is the substitutional account offered by (Kempson et al. 2004). The basic idea is that in linguistic comprehension an anaphoric expression is interpreted using the same mental representation as used for the antecedent, i.e. "it" here would be "replaced" in thought by the mental representation used for "Hesperus". These details are not relevant here, however, as it is not important to see the problem with Frege's proposal.

contexts, sameness of sense is necessary as well to preserve truth value[18]. That way, a Fregean can provide a prima facie plausible explanation using Frege's basic insight even if Frege's specific proposal is untenable[19]. Hence, the fact that Frege's specific proposal fails does not entail that Fregeanism is not viable as a general strategy.

At this point, it is useful to briefly mention a third use case Frege provides in favor of his sense theory, even if it plays no major role in the thesis. Frege notes that the intuitive Referentialist view on proper names is problematic for empty names as well (1892: 32). Referentialism, which holds that proper names have only reference as their semantic content, entails that empty names do not have any semantic content at all. Since empty names are not about anything, they fail to have semantic content altogether on this view. Given the principle of compositionality, it follows that no statement containing such a name can have content either. For a Referentialist, a statement containing an empty name simply constitutes a predication without target, as there is nothing of which a predication is made. Frege concludes that such statements could not possibly be true or false. If a statement does not really say anything, then it cannot say anything true or false either. However, Frege argues that propositional attitude statements again show this conclusion to be incorrect (1892: 32). While the first sentence is arguably neither true nor false, as there is no object of which something is predicated, it is hardly plausible to deny that the second could be true, especially if one envisages a scenario in which John mistakes Homer's tale for an actual historical account:

(13) Ulysses was put ashore in Ithaka while being dead asleep.

(14) John believes that Ulysses was put ashore in Ithaka while being dead asleep.

If the semantic content of proper names is purely referential, however, the name "Ulysses" will not have any content at all, and thus it should not be possible to say anything meaningful with it. Yet statement (14) clearly shows that it is possible, as it uses the name to say something potentially true. This strongly suggests that statements can be meaningful despite containing empty names. Frege again appeals to senses to explain this:

> "The sentence "Ulysses was put ashore in Ithaka while being dead asleep" obviously makes sense/has meaning/has a sense."
> (Frege 1892: 32, my translation)

Frege basically claims that the empty name "Ulysses" has semantic content because it has sense, which is available as the reference in the embedded context to explain the fact that the overall statement has a truth value[20]. While it is certainly not obvious that "Ulysses" does not refer to anything, as one may think it refers to a mythical or fictional character, empty names are generally considered a problem for Referentialist accounts of proper names, which is why many have appealed to empty names to make the case for a Fregean sense theory (Speaks 2010). Even so, this issue is not considered any further in the thesis. It is mentioned here only for the sake of completeness,

[18] To be precise, a Fregean can claim that sameness of sense is both necessary and sufficient for the preservation of truth under substitution, as sameness of senses is generally taken to guarantee sameness of reference.
[19] For a more detailed discussion on how the Fregean can do this, see Pietroski (1996).
[20] As seen, this account is probably mistaken. The alternative in the spirit of Frege is presumably to abandon the view that in embedded contexts proper names need a reference for the overall statement to have a truth value.

with the incidental comment that the version of Semantic Relationism adopted in this thesis is also able to accommodate empty names in much the same way that a Fregean sense theory can.

At any rate, the aim here is not to argue that the solutions Frege offers here in response to the three problems he sees for Referentialism are the only possible solutions, let alone the best ones. After all, the thesis ultimately favors Semantic Relationism over Fregeanism. The aim is rather to highlight why and how Frege came up with his novel semantic theory. It is crucial to realize in this regard that Frege did not simply think that having a two-tier semantic theory with sense and reference would be preferable, he rather thought it was theoretically inevitable. His arguments for senses are necessity arguments. Hence, while it is perfectly acceptable to disagree with Frege and to propose an alternative semantic theory, it is crucial to bear in mind that this imposes an obligation to show how the proposed theory can deal with the problems raised by Frege. In Almog's words:

> "As we all know, Frege's puzzle is alive and kicking; stronger yet, it dominates the agenda - it is the unsolvable problem every candidate theory must struggle with."
> (Almog 2008: 551)

1.1.4 Additional Fregean Background Theory

Before presenting theories with proto-Relationist ideas in the next section, a few brief remarks on Fregeanism in general. As seen, Frege argues that proper names have both a sense and a reference. The reference is nothing more than the object the proper name refers to. It is the object or person one can speak or think about by using the proper name[21]. Senses are much more vaguely characterized by Frege. In the passage quoted earlier, Frege holds that senses contain the modes of presentation of objects, rather than being identical with them. Although this raises important questions, it is more pertinent for current purposes to distinguish between two fundamental aspects of Fregeanism in this regard. The first and crucial Fregean thesis is that proper names have senses as their content, which are different from their reference, and which can be different even if two expressions share a reference. This basic Fregean idea constitutes the backbone of a Fregean semantic theory. The second, complementary thesis is that senses are or contain modes of presentations, or alternatively, that they are like descriptions. Both the descriptive and the non-descriptive view are often attributed to the historical Frege. The main difference between the two is that the descriptive approach entails that senses themselves have linguistic structure, while the non-descriptive approach is most often understood as taking modes of presentations to be a kind of non-linguistic equivalent of a description. Importantly, the first thesis is independent of the second. While the first essentially posits a semantic entity, the second characterizes its nature. Evidently, the latter is an derivative concern that only makes sense if the first thesis is correct. This has several consequences. First of all, a theorist can accept Frege's first thesis without having to agree with Frege on the second. Any philosopher who posits senses is therefore semantically speaking a Fregean, but that by itself does not imply any specific commitment on the nature of senses. Secondly, it justifies the clear differentiation that is made throughout the thesis between

[21] In the literature, a distinction is often made between the referent and the reference of a proper name, which is not present in Frege's writing. By referent, the actual object named by the proper name is meant, whereas reference is the semantic relation that holds between the proper name and the referent. This newer terminology is not adopted in this thesis. The reason is first, that the main interest of the thesis lies in Frege's level of sense, rather than reference, which makes the difference largely insignificant, and secondly, because it should always be clear from the context whether an object or a relation is meant.

Frege's semantics and a Fregean semantics. Frege's semantics is the view endorsed by the historical Frege, whatever that view exactly is. A Fregean semantics, in contrast, is any view that has a two-tier semantic theory with sense entities in addition to reference. Thirdly, and most importantly, this thesis is almost exclusively concerned with the first Fregean thesis, unlike most of the research on Frege and Fregeanism. The reason for this is straightforward, however. The claim ultimately defended in this thesis is that Frege's first thesis is mistaken. This means that the second issue becomes moot. If senses do not exist, there is no point in arguing about their exact nature.

Finally, a brief remark on how a Fregean sense theory relates to broader theories of linguistic understanding and communication. On the classical view endorsed by Frege, understanding a simple linguistic expression consists in grasping the sense of that expression (1892: 27). Similarly, understanding a complex linguistic expression, such as an entire sentence, amounts to grasping the complex sense it expresses, which Frege also calls a thought (1918: 61). Linguistic communication, in turn, consists in the successful transmission of thoughts. So linguistic communication is successful if a hearer grasps the Fregean thought that a speaker expresses with an assertion. In short, speaker and hearer must grasp the same Fregean thought. On the corresponding Language of Thought based model of understanding, which is explained in more detail later on, linguistic understanding consists in the successful translation of a linguistic expressions into thought, which is a linguistically structured mental representation. A Fregean theory of understanding on a Language of Thought based model of the mind holds that one understands a linguistic expression if one translates it into a mental representation that expresses the correct sense. Linguistic communication, in turn, is successful if the mental representation that underlies the intention of the speaker to communicate shares the content of the mental representation the hearer ends up with as a result of the communication. On the Fregean approach, the linguistically structured mental representation of the speaker has to express the same Fregean thought, or complex sense, as the mental representation of the hearer. In short, speaker and hearer have to share mental representations that express the same Fregean thought.

1.2 Proto-Relationist Approaches

1.2.1 Introductory Remarks

This section presents alternative approaches to Frege's Puzzle that also make use of Relationist ideas. The aim is to provide a theoretical background against which Fine's distinctive contribution can be better understood. Fine's basic idea is to introduce the relation of coordination as an independent semantic notion, in analogy to Frege's sense. Semantic Relationism exhibits several features that are anticipated, at least partly, by the approaches presented in this section. None of these proposals, however, combines these as systematically as Fine does.

The section starts by discussing Sainsbury's pared-down Fregeanism, which gives a preeminent role to the sense-identity relation. This is followed by Taschek's contribution on global logical structure. The third proposal comes from a little known paper of Macia on communicative chains, which relies heavily on Kripke's work on causal chains. Finally, the section compares Semantic Relationism to a recent paper from Heck on the importance of formal relations for solving Frege's Puzzle. Heck's contribution is particularly valuable as it is the only paper published after Fine's

Semantic Relationism, so that it has the added benefit that it explicitly compares both views. All these approaches seek to improve on Frege's insights by appealing to Relationist ideas. Hence, they share with Fine the opinion that the Puzzle shows that classical Referentialism is semantically inadequate, but also that the Fregean answer to the Puzzle needs improvement. The difference between them is evidently what improvements they think are necessary. It should be noted, though, that although these proto-Relationist views provide a theoretical background for Fine's proposal, they do not represent a genealogical context of origin. Fine was not familiar with any of these approaches at the time he developed his semantic theory[22]. Even so, the proto-Relationist proposals highlight the gradual emergence of Relationist semantic ideas that culminate in Fine's Semantic Relationism.

The basic method followed in this section is to motivate the proto-Relationist approaches and to compare them to Semantic Relationism. For that, a brief exposition of Semantic Relationism is required. Fine's central idea is to introduce a semantic relation of coordination instead of Fregean senses. As a relation, semantic coordination is roughly analogous to the identity relation between senses. The statement that two expressions are coordinated is roughly equivalent to the Fregean statement that the two expressions express the same sense. While the comparison with the sense identity relation is arguably the easiest way to understand the fundamental idea behind Semantic Relationism, it is evident that the analogy is not perfect, as coordination has certain features the sense identity relation lacks. These distinctive features form the basis for the arguments in this thesis that Semantic Relationism is ultimately preferable as a semantic theory. Although developing these arguments represents a key objective of the thesis, the primary goal in this section is rather to highlight the similarities and differences between Fine's proposal and the proto-Relationist alternatives. The first important approach in this regard is Sainsbury's pared-down Fregeanism, which is the topic of the next section.

1.2.2 Sainsbury's Pared-down Fregeanism

It was shown in the first part of this chapter that the general Fregean response to the Puzzle is to allow for differences in content between co-referential proper names on the basis of a difference in sense. These senses represent a secondary component of semantic content, which are specified by Frege to incorporate the mode of presentation of the primary component of content, reference. Two co-referential proper names thus have a different sense if the object they name is presented in different ways. As a result, the theory displays a distinct explanatory directionality: co-referential expressions are semantically different because they have different senses, and they have different senses because they present their reference in different ways.

Sainsbury basic methodology, which is representative of Fregeans more generally, is to start with Frege's theory and to get rid of the aspects of the theory that are either problematic or unnecessary so as to make the proposal more convincing overall (2002: 1). As the aim in this section is to highlight the emergence of Relationist ideas in semantics, the focus is on the features of Sainsbury's approach that are most relevant for a Relationist semantics. Therefore, the discussion does not attempt to do full justice to Sainsbury's overall approach to semantic theory developed over the years. That said, Sainsbury's pared-down Fregeanism is arguably best characterized as a position

[22] Fine has confirmed this in personal conversation.

midway between classical Fregeanism and full-blown Semantic Relationism. As it lays out the core motivation for departing from Frege in the way the Relationist does as well, it is obviously very helpful to understand Semantic Relationism from the more familiar Fregean point of view. Sainsbury's theory in fact shares many aspects with Semantic Relationism. There are important differences as well, however, and the aim in this section is to point them out and to raise some potential difficulties for Sainsbury in this regard, keeping in mind, though, that the primary aim here is not to refute Sainsbury's view, but rather to motivate why Semantic Relationism diverges from Sainsbury's proposal. More substantial arguments in favor of Semantic Relationism and against Fregeanism are presented later in the thesis, when the semantic theories are assessed in their application to solve different variants of Frege's Puzzle for the Language of Thought.

Sainsbury's theory is particularly instructive as one can think of Semantic Relationism as going even further than Sainsbury in paring down Fregeanism, which leads to the most minimal Fregean two-tier semantic theory possible and avoids even more problematic aspects of Frege's original theory then Sainsbury's already does. Admittedly, Fine characterizes Semantic Relationism as a version of Referentialism rather than Fregeanism (Fine 2009: 5). There are two points to make here, however. First, there are certain features in Fine's presentation of the theory that tip the balance in favor of a Referentialist characterization. These features, however, are rejected in the version of Semantic Relationism endorsed in this thesis. Secondly, it is useful to understand Semantic Relationism as a most minimal version of Fregeanism as it upholds what is the most distinctive feature of a semantic theory inspired by Frege, namely a two-tier approach to semantic content, which is in fact Frege's truly innovative insight. That said, however, the thesis restricts the term "Fregean" to semantic theories that follow Frege in positing senses, in which case Semantic Relationism does not qualify.

Going back to Sainsbury, his professed strategy regarding Frege's theory of senses is to

> "explore what can be rejected while retaining what [are taken] to be the crucial elements: that some co-referring singular terms make different semantic contributions, and so require different semantic accounts; and that a singular term may be perfectly intelligible yet lack a referent."
> (Sainsbury 2002: 1)

Sainsbury's basic idea to improve Fregeanism is not to reject senses, but to adjust what is semantically important about them by reevaluating how they are used to solve Frege's Puzzle. More specifically, for Sainsbury it is not the notion of sense that is semantically fundamental, but the sameness of sense relation. This section discusses five major aspects of Sainsbury's approach. The first two, crucial on Sainsbury's own account, concern the questions how senses fulfill their explanatory role in the semantic theory and what else they explain. The third aspect is the explanatory modesty of the approach. This issue is obviously closely related to the first two: while they are about what senses explain and how they do so, the third is explicitly about the question how much one can reasonably expect a theory of sense to explain. The fourth issue is the role of what Sainsbury calls "name-using practices" for a sense theory. The final aspect concerns the relevance of the type/token distinction for semantic theory. Sainsbury raises these points to highlight problems in Frege's theory and to offer improvements of a Relationist nature while maintaining the core idea of Fregeanism. As such, they also represent ideas that motivate the even more minimal approach to two-tier semantic theory represented by Semantic Relationism.

1.2.2.1 The Explanatory Role of Senses

Sainsbury's first important insight concerns the role of senses in the determination of reference. Sainsbury advocates a view on which sense determines reference only in the very weak sense that sameness of sense determines sameness of reference (2002: 17). There is no determination of reference beyond the fact that two expressions having the same sense is sufficient to determine that they have the same reference. This explanatory modesty sets Sainsbury's Fregeanism apart from a classical understanding of Fregeanism, as endorsed for instance by Dummett (1973). Dummett maintains that for Frege sense is the "part of meaning" of an expression that "determines its reference", which is not itself part of the meaning of expressions (1973: 91). The basic motivation for Dummett is the idea that because sense determines reference, knowing the sense of an expression is sufficient to know its reference. Understanding a proper name, which is to grasp its sense, therefore amounts to the ability to identify the object referred to by the name. Irrespective of whether this is the view of the historical Frege, it is a very common understanding of Fregeanism, which Sainsbury rejects by limiting the role of senses. The motivation for Sainsbury's rejection derives from the fact that it is plausible to assume that one can understand a proper name without knowing what object or person it exactly names (2002: 15). An example is a person who asks "How do you know this Peter?" after just having picked up that name in conversation. In that case, the person can successfully communicate about Peter, which entails full linguistic competence in the use of the name, without having the ability to identify its bearer. Since competence in the use of a proper name consists in grasping its sense, it follows that once can grasp the sense of a name without being able to identify its reference. Accordingly, Sainsbury argues that senses should not be taken to determine reference, if else one cannot uphold the idea that being linguistically competent with a proper name is explicable in terms of grasping a sense. Sainsbury then suggests a more moderate principle instead, according to which a person counts as understanding a proper name as long as that person realizes that the name as used by him or her is co-referential with the name as used by whoever the person picked the name up from. Hence, sense does not have to determine reference, it is enough if sameness of sense determines sameness of reference.

Sainsbury then goes even further and argues that sameness of sense is not only the primary notion for the determination of reference, but for semantic theory in general. In a section that discusses the ontological status of senses, Sainsbury states:

> "I make use of the notion of sameness of sense, but not of the notion of senses or thoughts as abstract entities. Although there may be theoretical pressures towards abstraction [...] it seems to me useful to start simply with sameness of sense"
> (Sainsbury 2002: 126)

The key idea is that what is really important for semantic theory is the sameness of sense relation rather than sense entities as such. This obviously constitutes an early endorsement of a Relationist approach to semantic theory. It is only proto-Relationist, however, in that it retains senses and only makes introduces a relation for the explanatory role of senses. This outcome is in fact not surprising given Sainsbury's avowed method of departing from Frege only to the extent necessary. It explains why Sainsbury moves towards a relational understanding of the explanatory role of senses, but as he does so with the explicit aim of staying within the basic Fregean framework, he introduces Relationist ideas into the theory of senses developed by Frege.

To motivate the relational explanatory picture, Sainsbury uses the sameness of sense relation to explain for instance the validity of logical inferences, as in (2002: 136):

(15) "a is F" and

(16) "a is G" to

(17) "there is something that is both F and G"[23]

For a Fregean the validity of the inference is based on fact that both "a" tokens have the same sense, which guarantees that they have the same reference, and thus legitimizes the claim that there is one object that is both F and G. The crucial point Sainsbury notes is that the sense of "a" is actually irrelevant for this explanation, and need not even be specified. All that matters semantically, and hence logically, is that both "a" tokens have the same sense. Hence, the sense of "a" is actually immaterial for semantic purposes. The explanatory role of senses is entirely derived from the fact that they are relata of the sense identity relation. A semantic theory, Sainsbury argues, can thus rely exclusively on this relation, which has two big advantages. First of all, it allows for a certain explanatory modesty, about which more later. Secondly, it allows Sainsbury to address a familiar worry with Frege's classical proposal:

> "[E]ven if [Frege] tells us when names differ in sense, [he] does not quite tell us what the sense of a name is."
> (Speaks 2010)

Instead of providing an answer to this question on behalf of Frege, Sainsbury proposes a version of Fregeanism that makes it moot. On Sainsbury proposal, it is not necessary to specify what the individual senses of names consist in, it is enough to determine whether two uses of a name stand in the sameness of sense relation or not.

Sainsbury also claims that this point about the explanatory role of senses relieves a Fregean of the burden of positing senses as abstract entities in a third realm, which Frege notoriously thought necessary:

> "Many of Frege's main claims can be phrased with recourse merely to the same-sense relation, without invoking senses as entities", and "a [...] Fregean position [...] can be developed [...] without senses as entities."
> (Sainsbury 2002: 184, footnote 4)

Whether that is correct, however, is questionable. On Sainsbury's account, senses are still abstract entities in need of an ontology. The semantically relevant sameness identity relation is evidently not an entity, but that does mean that the senses that are the relata of this relation are no longer entities either. It is important to distinguish here between the explanatory and the ontological order of explanation. Sainsbury can reasonably claim that for explanatory semantic purposes, sameness of sense is prior to senses as entities, but that does not change the ontological fact that the sense identity relation holds between senses as entities. Hence, the reversal of the explanatory order does not change the fact that the theory adds senses to the ontology. Being aware of this, Sainsbury attempts to downplay the ontological status of senses by speaking of them as "things which are not

[23] In formulas, from "F(a)" and "G(a)" to "$\exists$x(F(x)&G(x))"

entities" (2002: 190) . Other examples Sainsbury mentions in this category are facts or questions. If somebody asks four things, for instance, it is clear that the person does not ask for four entities. Questions are thus things but not entities. However, this only shows that it makes ontological sense to distinguish between things an entities, but it by no means motivates the claim that senses are things rather than entities. It only shows that they could be, but not that it is plausible to assume that they are. Unfortunately, Sainsbury fails to provide an argument for the claim that senses are ontologically as unproblematic as questions because they are things rather than entities, however.

Hence, Sainsbury fails to present a plausible case to dispel the worry of Fregean senses as entities. Up to this point, the Relationist can actually agree with Sainsbury's main ideas. Since Semantic Relationism has coordination instead of sense identity, for instance, the Relationist also endorses the claim that the second level of semantic content only determines sameness of reference (Fine 2009: 58-60). In this case, however, the Relationist will claim to have an edge over Sainsbury. From a Relationist perspective, Sainsbury attempts to mitigate the consequences of the view without addressing the real worry, which stems from the fact he shifts what is semantically important to a semantic relation without changing how that relation is understood. By conceiving of the semantically explanatory relation as relation of identity between senses, Sainsbury fails to realize that it is possible to conceive of it without invoking senses at all. That way, the proposal avoids the problematic ontology of senses only insofar as it is semantically explanatory, but that does not altogether diffuse the ontological worry. More precisely, the root problem is Sainsbury strategy of retaining as much from Frege as possible. The aim of staying within a Fregean framework prevents Sainsbury from adopting a fully Relationist semantics, which in turn precludes him from dispelling the ontological doubts about senses. In other words, the modesty of the proposal in terms of semantic explanation does not translate into the desired ontological modesty. The problem is that Sainsbury's reversal of order is only partial. It gives up the explanatory but not the ontological primacy of senses. Senses remain ontologically more fundamental than the sense identity relation, as they ontologically constitute that relation. In stark contrast, the Relationist rejects the idea that something intrinsic to expressions such as senses are ontologically constitutive of the semantically relevant relation of coordination. That way, it avoids the problem about the ontological status of senses that Sainsbury faces[24].

While Sainsbury's account is clearly unable to abandon the ontological primacy of senses, it is also questionable whether it in fact succeeds in reversing the explanatory primacy, a worry raised by Kölbel:

> "However, I believe that Sainsbury needs to offer some viable reduction of grasping sense to sameness of sense in order to make good his claim that all we need to use is a relation of sameness of sense."
> (Kölbel and Textor 2004: 189, see also 191-192)

Kölbel here challenges Sainsbury to provide an account of grasping senses in terms of the sense identity relation. The more general point Kölbel raises is that the role of senses has to be replaced

[24] In Fine's terminology, explained later on, the problem is Sainsbury's ontological if not his explanatory commitment to the doctrine of Intrinsicalism, which holds that all semantically relevant features have to be intrinsic to individual expressions. Sainsbury makes a difference between what does the semantic work (the sameness of sense relation), which is relational, and how that relation is ontologically understood (on the basis of the senses of individual expressions), which remains committed to Intrinsicalism. His strategy of departing from Frege thus entails that Sainsbury saddles himself with senses as abstract entities as historical baggage. Fine, in contrast, rejects Intrinsicalism entirely.

throughout the theory by the sameness of sense relation to justify the claim that the explanatory order has been reversed, as is necessary (but as mentioned, not sufficient) to deliver on the promise of avoiding the difficult ontology of senses. The problem is that Sainsbury fails to do this. While Sainsbury convincingly argues that senses are not necessary in many cases where classical Fregeanism deems them necessary, as in their role as the oblique references in belief reports, they remain necessary for the Fregean conception of linguistic understanding as the grasping of senses. In fact, Sainsbury admits that senses are necessary to "count items of knowledge" as well (2002: 10). So when John knows two things, for example, the two things he knows are Fregean thoughts, which are complex senses as expressed by the sentences that would state what John knows. In this case, it is evident that not the relation of sameness of sense does the philosophical work, but senses as such, as they constitute the thoughts that are counted. This shows that Sainsbury cannot justifiably claim that sameness of sense alone is theoretically explanatory, which confirms Kölbels doubt that everything senses do in the classical Fregean picture can be captured by the sameness of sense relation. So despite the explanatory importance of the sense identity relation, the account essentially retains senses as well, which leaves Sainsbury with the dubious strategy of claiming that senses are ontologically unproblematic because they are things and not entities.

Sainsbury thus falls short on two counts. First, he fails to show that Fregean senses can be fully replaced by a semantic relation for the purpose of semantic explanation. Secondly, he fails to demonstrate that even with a reversed explanatory order, the ontological worry pertaining to senses disappears. This raises two important questions for the Semantic Relationist. First of all, whether Semantic Relationism really avoids senses, or something analogous, unlike Sainsbury pared-down Fregeanism. Secondly, what, if not senses and thoughts, is to be counted as items of knowledge on a Relationist semantics. These questions are addressed in the chapters on Semantic Relationism and the theory of propositions. To give at least a rough idea, the basic claim is that one counts as items of knowledge the bearers of semantic content, which are individuated by their content[25].

1.2.2.2 Senses and Classical Conceptions

The second aspect of Sainsbury's pared-down Fregeanism relevant for Semantic Relationism is his abandonment of an explanatory thick conception of senses. For Sainsbury, senses incorporate neither descriptive content nor modes of presentation. The motivation for this explanatory modesty is straightforward given his overall strategy. With sameness of sense the primary explanatory notion, Sainsbury notes that it cannot depend on sameness of mode of presentation or description, as they do not necessarily overlap:

> "there is no independent account of modes [of presentation] which provides the right taxonomy for semantics."
> (Sainsbury 2002: 156)

[25] This issue is clearly just one aspect of a broader problem of what is quantified over in statements such as "Mary believes everything John knows". In the final chapter of the thesis, it is argued that quantification in such cases is over propositions, but that propositions are not contents, which Fregean thoughts are, but the bearers or vehicles of semantic content. The fundamental idea is thus to account for such linguistic constructions by quantifying over content bearers rather than contents, where, crucially, the content bearers are individuated by their content to ensure a sufficiently robust connection between content and what is quantified over.

Sainsbury's point is to reject the overoptimistic idea that there is always an identity in description or mode of presentation available to explain the semantically crucial identity in sense, as many classical Fregeans assume, Evans for instance (1985: 294). Although the view that senses are descriptive and the view that they are, or contain, modes of presentation differ in many important respects, they share the common assumption that sameness of sense is always explicable in terms of something else, whether it is an identical description that is associated with two expressions or the fact that they both present their reference in the same way[26]. The problem is that even though this assumption is without a doubt plausible for many use cases, both views are committed to the stronger claim that such an explanation is universally available. If sameness of sense is taken to consist in sameness of mode of presentation, then every case of sense identity must be explicable in terms of an identical way a given reference is presented.

Sainsbury has two good reasons for not identifying senses with modes of presentations. First, in some cases the senses of two expressions are plausibly the same even though the expressions present their reference in very different ways, and secondly, sometimes the senses are distinct even if they present their reference in the same way (2002: 156-157). The specific argument is not important at this stage, as a similar argument is presented in the context of the Language of Thought later on. What is important is that this explains Sainsbury's claim that modes of presentations individuated non-semantically do not provide the right taxonomy for semantic purposes. Clearly, this argument applies to the conception of Fregean senses as modes of presentation as well as descriptions[27]. This point also emphasizes the minimalist outlook of Sainsbury's theory. By giving up the strong commitment to a non-semantic basis for sense identity that is universally available, Sainsbury offers a semantic theory that provides less than many classical interpretations, but it thereby also avoids the difficulty to account for cases where sense identity is not matched by an identity in description or mode of presentation. Semantic Relationism adopts this strategy as well (Fine 2009: 60). The claim that semantic coordination relations are irreducibly relational, which is to say that they are "not reducible to the intrinsic semantic features of the expressions between which they hold" entails that it is not generally possible to account for coordination on the basis of an identical description or mode of presentation (Fine 2009: 3).

Sainsbury further argues that the existence of senses is independent of the existence of a reference. The opposite view is notoriously held by McDowell (1984) and Evans (1985). Their approach is based on the idea that senses, as modes of presentation of an object, require the existence of an actual object to be presented in a certain way (Evans 1985: 295). The obvious problem with this view are empty names, as Frege himself made clear, as they make sense despite not having a reference. As shown, this assumption is actually crucial for the plausible view that sentences with empty names can be understood and even be used to say true things. In fact, descriptivism provides a nice way out of this problem, given that senses as descriptions do not require an actual denotation to be meaningful, as evidenced by a description such as "the greatest prime number", which is in fact necessarily without object. Sainsbury does not want to deny this, he merely points

[26] Hence it makes sense to take the descriptivist and the mode of presentation view to be equivalent for current purposes. Arguably, descriptive views merely add a requirement of verbalizability to modes of presentation, which is to say that it assumes that modes of presentation are always able to be expressed verbally, at least in principle. A description is then nothing more than a verbalized equivalent of a mode of presentation. It is a linguistically mediated way of presenting an object.

[27] Descriptivism is largely considered discredited by most contemporary philosophers. For rare defense of descriptivism, see Kroon (2004) and Macia (2004), who offers a good overview of mainly Kripke's anti-descriptivist arguments as well (2004: 131).

out, correctly, that while descriptivism is sufficient to guarantee the object-independence of senses, it is not necessary. As a result, the rejection of descriptivism does not entail a commitment to the object-dependence of senses. What possible alternatives are there, then, to guarantee object-independent existence of senses? Sainsbury opts for homophonic truth-theoretic axioms paired with a negative free logic to ensure the existence-independence of senses:

> "the sense of a name is to be given through a specification, which will typically reuse the name in question, of the conditions under which it has a referent, for example: for all x, "Hesperus" refers to x iff x is Hesperus". [...] [I]t is essential to the position I favour that such sense-revealing axioms do not commit the theorist to the existence of a referent. This means a departure from classical logic to a negative free logic [...]"
> (Sainsbury 2002: 14)

Sainsbury characterizes the resulting position as follows:

> "Pared down Fregeanism [...] shares with Millian views a denial of descriptivism, and with conventional Fregean views the admission of the possibility of coreferring expressions which require different semantic descriptions and the possibility of names which lack a referent"
> (Sainsbury 2002: 19)[28]

It is also interesting to note that both the descriptivist and the mode of presentation view entail a truth-conditional difference between proper names that are co-referential but sense-distinct. On either view, it is assumed that the sense of, say, "Phosphorus" is the same as that of "the star visible in the morning" and likewise for "Hesperus". It follows that otherwise identical sentences containing the names "Phosphorus" and "Hesperus" such as the following are truth-conditionally different in the same way that the corresponding sentences with the descriptions are:

(18) Phosphorus is a heavenly body.

(19) Hesperus is a heavenly body.

(20) The star visible in the morning is a heavenly body.

(21) The star visible in the evening star is a heavenly body.

Evidently, what it takes for an object to be visible in the morning is not the same as what it takes for an object to be visible in the evening, and hence sentences containing one description are not made true by the same state of the affairs as sentences containing the other. Given that the senses of proper names are identified with the senses of these or similar descriptions, the same truth-conditional difference exists for the sentences with the proper names as well. Differences in sense reflects are thus reflected as truth-conditional differences in classical Fregeanism. Surprisingly, Sainsbury upholds this idea despite his minimalist approach to Fregean senses:

[28] Interestingly, Fine initially adopts an existence-dependent view of coordination as well, by taking semantically required co-reference to be factual (Fine 2010c: 497). He points out, however, that this assumption is not necessary for Semantic Relationism (2010c: 498). The version of Semantic Relationism adopted in this thesis rejects the factual or existence-dependent nature of semantic coordination. On the proposed view, mental representation tokens can be semantically coordinated even if they lack a reference. The underlying principle is simply that coordination guarantees sameness of reference in the sense that the expressions cannot fail to have a different reference.

> "I take it for granted that what it would be for "Hesperus is visible" to be true is not the same as what it would be for "Phosphorus is visible" to be true."
> (Sainsbury 2002: 208, footnote 6)

The claim is hardly plausible, however. Given that Hesperus is identical to Phosphorus, they are visible in exactly the same circumstances. Therefore, a sentence containing one name is conditional for its truth on precisely the same state of affairs as a sentence containing the other. While one can agree with Sainsbury that both statements mean different things, it seems rather obvious that they are nonetheless true in exactly the same circumstances. This is to say that both sentences are truth-conditionally but not semantically equivalent, which shows that the semantic content of a sentence consists of more than just its truth-conditions.

An advantage of Semantic Relationism is therefore that it does not assume a truth-conditional difference between co-referential but sense-distinct proper names. A difference in semantic coordination does not entail a truth-conditional difference (Fine 2009: 59). The deeper reason for this is the fact that in contrast to the Fregean, the Semantic Relationist locates the second level of content between expressions, so to speak, rather than between expressions and their reference. This explains why coordination has fundamentally no relevance in terms of what individual proper names are about, and hence under what conditions sentences that contain them are true. This is important because it shows that Semantic Relationism constitutes the better semantic theory even though Sainsbury also has the option to abandon his commitment to the truth-conditional impact of differences in sense. The crucial point is that Sainsbury's Fregeanism can reject this impact as an option, whereas Semantic Relationism rejects it by necessity. While is is tempting to think that this speaks in favor of pared-down Fregeanism for the reason that it provides more theoretical options, the opposite is actually the case. The first reason is that Semantic Relationism systematically excludes a false conception of the truth-conditional impact of the second level of content, which pared-down Fregeanism can incorporate only by fiat. Secondly, and much more importantly, Semantic Relationism thereby contributes towards explaining why the second level of content is truth-conditionally irrelevant, which pared-down Fregeanism is unable to do.

1.2.2.3 Explanatory Aim of a Sense Theory

The third point concerns the explanatory aim of a theory of senses, or more generally, a semantic theory with two levels of content. Sainsbury states:

> "It is not that, for the trivial cases [such as "a=a", HW], we apply antecedent knowledge of sameness of sense to derive the trivial truth; rather, the fact that on occasion we are fully justified in taking sameness of reference for granted is what marks sameness of sense."
> (Sainsbury 2002: 18)

On Sainsbury's proposal, senses are a theoretical devise to capture semantically guaranteed sameness of reference without providing a substantial explanation of why sameness of reference is in fact guaranteed. This evidently contrasts with classical Fregean accounts, which for instance explain the guaranteed sameness of reference of two expressions on the basis that they both present their reference in the same way, say, as the star visible in the morning in the case of "Phosphorus".

Sainsbury's modest approach offers no such explanation. Accordingly, a reasonable worry is that appeal to senses in Sainsbury's account is nothing more than an ontologically loaded way of re-describing a problem. This is not the case, however. The reason is that the explanatory modesty does not have to be interpreted as a universal renunciation of providing an explanation, but only as the rejection of the commitment to provide the same type of explanation in all cases. In this vein, Sainsbury agrees that

> "something needs to be said about the circumstances under which this justification arises."
> (Sainsbury 2002: 18)

To make this point clear, a comparison with the classical descriptive view is helpful. The descriptivist holds that sameness of sense is tantamount to sameness of associated description, which entails that whenever two proper names have the same sense, they have the same associated description. In fact, the descriptivist is even committed to the stronger claim that one and the same description is universally associated with any proper name. However, even the weaker claim that in all cases of sense identity between two proper names an identical description is required already incurs a commitment that Sainsbury does not accept. Instead, Sainsbury's theory allows that in some cases sameness of sense between proper names is explained on the basis of an identical description, but that in other cases something else explains sameness of sense, for instance, the mere visual salience of a person. In that case, Sainsbury can maintain that visual salience explains sameness of senses, which in turn guarantees sameness of reference, which is not something the descriptivist can say. Fine arguably implies the same when speaking of coordination as irreducible (2009: 3). Plausibly, this is not supposed to mean that it can never be explained why two expressions are coordinated. It only means that one should not expect the same explanation to be available in all cases. In the version of Semantic Relationism ultimately adopted in this thesis, the claim is that facts about semantic coordination are partly grounded in cognitive facts and partly in facts about linguistic communication. Accordingly, semantic facts about coordination are not reducible to cognitive facts, as in some cases coordination is grounded in communicative facts, but they are not reducible to communicative facts either, as in some cases they are grounded in cognitive rather than communicative facts.

According to Sainsbury, this explanatory modesty helps to curb unrealistic explanatory expectations:

> "I consider the idea that we can get a fix on sameness of sense in terms of the criteria we adopt for counting reports of speech as correct or incorrect: in short, in terms of samesaying. This is typical of the inversion of traditional Fregean priorities which I think is appropriate. Whereas, traditionally, the Fregean would "account for" or "explain" the correctness of reports of speech in terms of the same sense relation, I think that this places too much confidence in the antecedent availability of the notion of sense, and that a more modest aim is more appropriate because attainable: to take as data our judgements about the correctness of reports of speech, and use these to animate the conception of sense."
> (Sainsbury 2002: 8)

Arguably, Sainsbury suggests a stronger claim here to the effect that samesaying or successful communication explains the notion of sameness of sense. It is crucial to note that this is not an epistemological claim stating that one can only know that two expression have the same sense on the basis of a prior judgment that some instance of communication was successful. That version is innocuous. Instead, the claim is presumably that successful communication "accounts for" sameness of sense, and not just our knowledge thereof.[29]. This idea should be rejected, however, if else it will be fair to argue against the semanticist that the proposed "solution" is in fact nothing more than a re-description of the problem in different theoretical terms. Specifically, the charge then is that the semanticist, instead of explaining a linguistic phenomenon, has simply replaced phrases such as "... says the same as ..." with phrases such as "... has the same sense as ..." without adding anything by way of explanatory value. Instead, one should maintain that phenomena such as successful communication are theoretically explicable in terms of the secondary component of content, be it in virtue of sense-identity or semantic coordination, which is in turn explicable on the basis of various non-semantic facts. The modesty of the approach merely lies in the admission that it is not possible to appeal to the same kind of fact to explain all the relevant linguistic phenomena.

The following example can clarify this point. If a person B derives the use of a name N from a person A, it is according to Sainsbury not that the names as used by both A and B have the same sense that explains why the linguistic transaction counts as a successful derivation of a name, it is rather the fact that the name is derived successfully which explains why and in what sense they have the same sense. An opponent can therefore object that saying that the names have the same sense is just a different way of saying that their communication using that name is successful. In contrast, on the proposed version of Semantic Relationism, the communicative fact that the use of the name N by B was derived from the use of A grounds, and thus explains, the semantic fact that they are semantically coordinated. This semantic fact, however, in turn explains why the communication using that name between A and B was successful, as it ensures that both persons use a name that is co-referential for the right semantic reasons. The major difference is thus that Sainsbury seems to reject any explanatory role for his secondary notion of content with regard to successful communication, while the account offered in this thesis only rejects the idea that the secondary notion of notion is always explicable in the same non-semantic way.

A further modesty in Sainsbury's account, already mentioned, is that knowledge of the sense of a name does not require acquaintance with its reference or even the ability to uniquely identify it. By giving up this Fregean idea, Sainsbury rejects the metaphoric understanding of senses as "informational routes to reference" (Gaskin 1997: 132). Many classical versions of Fregeanism are more demanding in this regard. If the sense of a proper name is a de re mode of presentation of an object, as Evans for instance maintains, it is clear that one can only grasp the sense of a proper name if one is acquainted with the object referred to by the name. This modesty is highly plausible, however, if else one cannot respect the reasonable claim that it is possible to understand a proper name without knowing who or what it exactly names. As explained already, a descriptivist account has the advantage that it rejects a strong knowledge requirement for proper names. Sainsbury's sound strategy is thus to reject the descriptive account while retaining one of its desirable features.

[29] The difference can perhaps be explained with an analogy in modern physics. The claim that in quantum physics observations cause the collapse of quantum states is evidently different from the claim that these observations cause our knowledge of the collapse of these states. That observations cause our knowledge is true for physics in general, including classical physics, while the causal effect of observations on actual physical states holds true only in quantum physics.

For Sainsbury, knowing the sense of a proper name requires nothing more than being part of what he calls the right "name-using practice":

> "[...] Gareth Evans [..] thought that one who understood a name should have the capacity to distinguish its bearer from all other things. Positions of this kind appear to be at variance with the very weak conditions that we in practice place upon what understanding a name involves. Someone in a conversation starts using a name which is unfamiliar to me, but it takes little time for me to count as a party to this name-using practice, even though I have no independent capacity to distinguish the bearer from all other things: the best I could do would be to describe the bearer as whoever the other person was referring to by the name."
> (Sainsbury 2002: 15)

The idea is thus that one can count as grasping the sense of a proper name even if one just picks up that name in a conversation without knowing much about who the person named is. This imposes no strong requirements on knowing the reference, such as being able to identify him. It is enough to know, disquotationally, that the name "John", say, as used in the conversation refers to John, without knowing anything further about John, let alone something specific enough to identify him.

1.2.2.4 Senses and Name-using Practices

The name-using practices mentioned in the quote above play an important role for Sainsbury in grounding the sameness of sense relation:

> "To understand "Hesperus", to know or grasp its sense, is to know that it refers to something iff that thing is Hesperus. [...] [O]ne possesses the knowledge by being party to the practice of using"Hesperus" as a name which is supposed to refer to Hesperus."
> (Sainsbury 2002: 15-16)

The participation of speakers in such practices enables and explains the sense-identity between their uses of proper names, as it provides the participants with the necessary justification for the assumption that a name is used with the same reference. Name-using practices in turn rely on a causal mechanism:

> "A name-using practice [...] is in part determined by causal links in rather the way that Kripke suggested."
> (Sainsbury 2002: 18)

Hence, if a person picks up a name from another, the causal link between the two uses of the name establishes a name-using practice, which then forms the basis for the sense-identity relation, which in turn provides the semantic guarantee for sameness of reference. Causal links between proper name uses, which Sainsbury also calls "causal coordination", provide the explanatory foundation for the sense-identity relation (2002: 19) . Sameness of sense holds between all uses of a proper name that constitute a name-using practice.

Despite important differences, Semantic Relationism partly agrees with the view advocated by Sainsbury in this regard. Specifically, the version of Semantic Relationism in this thesis accepts the causal basis of intersubjective coordination, which is the coordination that holds between

expressions of different language users, for example a speaker and a hearer in a conversation. Fine expresses the same idea when he grounds this type of coordination in what he calls the "derived use" of proper names, which also relies on a causal mechanism (2009: 98). Roughly, one person's use of a proper names is derived from another person's use of that name it the use of the latter is causally responsible for the use of the former. Importantly, however, on the proposed view there is another type of coordination as well, namely intrasubjective coordination, which is the coordination of expressions as used by individual subjects, that needs to be grounded differently.

To the extent that Sainsbury advocates a partial reliance on causal facts to explain the secondary notion of semantic content, both views coincide. There remains an interesting difference worth noting, though, as it is representative of the broader divergence in outlook. Sainsbury introduces coordination as a causal mechanism that belongs to the meta-semantics, and which is semantically relevant only via the sense-identity relation (2002: 18). Fine, in contrast, builds coordination into the semantics. In other words, for Sainsbury the fact that there is coordination explains a semantic fact, while for the Semantic Relationist such a fact constitutes a semantic fact[30].

Sainsbury also proposes a criterion for the individuation of name-using practices. They are individuated by their source in acts of name-introductions (2002: 210). This raises a possible worry for Sainsbury, however, as Kripke argued that a baptism can only occur if there is actually an object to be baptized (2002: 210). Sainsbury can evidently not accept this, as it would jeopardize the possibility of senses without reference:

> "However, it is unclear that the relation to the object could do any work: so long as the baptism does invest the name with a meaning, we need only check whether subsequent uses are related appropriately to it in order to determine that they belong to the same name-using practice. The Kripkean referent thus appears to be idle in the account of the unity of a name-using practice [...]. The alternative I propose fora Fregean account adopts Kripkean ideas about transmission, while eliminating the object."
> (Sainsbury 2002: 212)

Sainsbury seems to support two eliminations here. First, he claims that the actual object named in a baptism is irrelevant, as a baptism can invest a name with a meaning even if there is no real object present, in case of a hallucination, for instance. Secondly, he also advocates the primary importance of transmission over baptism and name-introduction. Sainsbury thus appears undecided here. One the one hand, he argues for the possibility of a baptism without an object, on the other hand, he maintains that name transmission is more important than name introduction, which, if correct, makes the first point moot. If the baptism is not actually important, given that only subsequent transmission matters, then it is irrelevant whether a baptism requires an actual object or not.

At any rate, the proposed view adopts what appears to be Sainsbury's stronger claim here, that neither an object nor a name-introduction is criterial for the individuation of the second level of semantic content. In fact, the question how the second level of semantic content is individuated is of the utmost importance. If baptisms individuate name-using practices, which in turn determine the

[30] Sainsbury specifies that causal coordination "would be very hard to spell out in detail, but [...] there is no need to suppose [it] involves any mental facts about the participants" (2002: 18-19). The version of Semantic Relationism endorsed in this thesis actually agrees with this, as intersubjective coordination relations are based on causal rather than cognitive facts. Intrasubjective coordination facts, however, are grounded in mental facts. As Sainsbury seems to reject this idea, it would be interesting to know how Sainsbury thinks sense identity is grounded in case it holds between two sense-identical uses of a proper name by a unique person.

sense identity relation, it follows that senses are individuated by baptisms as well, in that all uses of a name that trace back to the same baptism will have the same sense. A possible worry is thus whether it is not possible for a proper name to be based on two distinct baptisms. This worry can be addressed, however, by the plausible counterclaim that in such cases there really is a confused use of two different if co-referential and homophonic names, especially in view of the fact that if the baptisms are truly independent, it is a matter of sheer coincidence that the proper names are homophonic. The far more substantial worry, however, is the inverse, namely the possibility that one and the same baptism can lead to different names. This issue can be set aside here, however, as it will be raised in a later chapter with regard to Sainsbury's proposal to individuate concepts on the basis of their origin, which basically amounts to the same idea (Sainsbury and Tye 2011). For now it can suffice to point out that because of the transitivity of the sense-identity relation, Sainsbury cannot accept the possibility that two uses of a name that trace back to the same baptism differ in sense. The Semantic Relationist, in contrast, is able to accommodate the possibility that uses of a proper name with the same origin are uncoordinated, about which more later on. Despite this difference, however, it should be emphasized that the Relationist view proposed in this thesis shares a lot of what Sainsbury argues for at this point. On the proposed view, what matters from a semantic point of view is the transmission of proper names by linguistic means, constituted by causal facts about communication that ground semantic facts about coordination.

1.2.2.5 Types and Tokens

The final aspect of Sainsbury's theory useful to make sense of the Relationist view presented in this thesis is his discussion of the question whether semantic theory applies primarily to the types or the tokens of linguistic expressions. Sainsbury actually controverts the common wisdom in the literature that a semantic theory is concerned primarily with types (2002: 9). The proposed Relationist view accepts this rejection of the accepted opinion, if for very different reasons. Sainsbury's main reason for thinking that the primary objects of a semantic theory are tokens rather than types are indexical expressions, which are characterized by the fact that their reference can change from one occasion of use to another:

> "[T]he sense–reference distinction applies at the level of individual utterances: to expression tokens rather than expression types. One reason for this assumption is that it is obvious that a constant sense cannot by itself determine the reference of expression types whose tokens vary in their reference from occasion to occasion."
> (Sainsbury 2002: 125)

The basic point is that senses cannot be ascribed to indexical expression types because these can change their reference from one occasion of use to the next, which undermines the principle that sense-identity guarantees sameness of reference. Sainsbury concludes that since senses cannot be attributed to some expressions types, they have to be attributed to expression tokens in general.

On the proposed view, the main reason for the assumption that semantics is primarily concerned with tokens is unrelated to indexicals, for two reasons. First of all, there is a good reason to think that semantics is generally concerned with expression tokens, independent of the specific type of expression. The reason is that it is a non-trivial issue to say which expression tokens belong to the same expression type. A response to this so-called type-identity problem for linguistic expressions

requires a criterion that systematically determines when and why two expression tokens are type-identical. Although this problem is discussed in great detail later on for Language of Thought expression tokens, it can already be mentioned that the thesis defends the view that the problem can only be solved semantically. This is to say that the only adequate criterion to determine the type identity of expressions tokens is their semantic content, based on the principle that tokens count as type-identical if and only if they have the same semantic content. Crucially, however, this response is precluded on any view that takes semantics to be primarily concerned with expression types, and which ascribes semantic content to tokens only in virtue of their type-identity. The obvious reason is that such a view is predicated on the assumption that the type-identity problem can be solved without involvement of the semantic theory. Hence, if it turns out that only a semantic criterion is adequate for the type-identity of linguistic expressions, as will be the argument in the case of Language of Thought expression tokens, then the primary applicability of semantics to types has to be rejected. As an added advantage, this argument removes doubts about the validity of Sainsbury's generalization from the impossibility of attributing senses to indexicals to the inadequacy of doing so for expressions in general.

Secondly, there are reasons specific to the current proposal not to rely on indexicals. The reason is that on the current proposal, semantic theory is taken to apply exclusively to the Language of Thought, which is a symbolic system of mental representations that, importantly, constitutes an indexical-free language. The basic motivation for the assumption that the Language of Thought is indexical-free is that it allows for an explanation of how people interpret natural language indexicals as well as how they store information conveyed by means of them. Roughly, the idea is that people interpret natural language indexicals by translating them by the correct referential concept in the Language of Thought[31]. For instance, an utterance "he is crazy" made about John is correctly interpreted if it is translated into the Language of Thought in the same way as the utterance "John is crazy". In that case, the indexical "he" has been translated with the concept for John, which also underlies the use of the proper name "John"[32]. Moreover, this is also how the information about John has to be stored in memory, as the multiple applicability of the indexical makes it a symbol unsuitable to store information specifically about John.

Indexicals, in contrast, are part of natural languages, which have linguistic meaning rather than semantic content. Roughly, the basic idea is that a semantic theory is concerned fundamentally with the relations between linguistic expressions and the world, and the conjecture is that only the expressions of the Language of Thought stand in such relations. On this view, natural language expressions have no semantic content strictly speaking, only linguistic meaning, which consists in a relation between natural language expressions and the mental representations that have the semantic content intuitively associated with the natural language expressions themselves[33]. In other words, natural language expressions have semantic content only in a derivative sense. They relate

[31] These concepts, often called singular concepts in the literature, are the equivalent in thought of natural language proper names.

[32] Evidently, in order to derive the right singular concept, one has to to know the Kaplanian character of the indexical, which is part of the meaning of natural language indexicals that determines what reference has been made depending on the context. As mentioned, this thesis distinguishes between the semantic content of Language of Thought expressions, which consists for instance in the referential relation between the concept DOG and the property of being a dog, and the meaning of natural language expressions, which consists in the relation between words and concepts, as in "dog" means DOG.

[33] To say that natural language expressions have no semantic content is to say that they do not stand in referential relations to extra-linguistic objects and that they are not the relata of semantic coordination relations.

to the world only via the mental representations that do, and with which they are associated by virtue of the linguistic competence of speakers. On this model, understanding a natural language expression consists in the ability to translate it into an expression of the Language of Thought with the correct semantic content. For an indexical such as "he", the correct expression is a concept that refers to the person the speaker intends to refer to by means of the indexical. If that is correct, however, indexicals cannot have the status of motivating a token-first approach to semantic theory in the way claimed by Sainsbury.

The current proposal is thus based on a conception of language that is fundamentally partitioned, in the sense that there is linguistic meaning for natural languages and semantic content for the Language of Thought. Semantic theory, with notions such as sense and reference, applies only to expressions of the indexical-free Language of Thought. Accordingly, the basic question Sainsbury raises about the sense of indexicals does not even arise. On the proposed view, it is a misguided question due to a mistaken picture of language and its relation to reality[34]. Evidently, it is not possible to comprehensively defend such a sweeping proposal here. The main point is merely that the type-identity problem suggests that semantic theory is concerned primarily with the expression tokens of a language, even if that language is indexical-free. In fact, even if Sainsbury does not explicitly say so, he hints at a view on which tokens are type-identical if they have the same sense (2002: 135-137 and following). Hence, it is reasonable to assume that Sainsbury does not disagree with the role of the type-identity problem in establishing that tokens are the primary target of a semantic theory. Importantly, however, it will be argued later that semantic coordination between tokens is an adequate criterion for type-identity, while sameness of sense is not, which shows that Semantic Relationism is preferable to Sainsbury's pared-down Fregeanism.

In conclusion, while Sainsbury's approach is motivated in much the same way as Semantic Relationism, a case can be made that Semantic Relationism is nonetheless the better semantic theory. The next section considers the proto-Relationist proposal offered by Taschek.

1.2.3 Taschek's Global Logical Form

One of Taschek's best-known contributions to the philosophy of language consists in his persistent effort to argue against pragmatic solutions to Frege's Puzzle (Taschek 1992; 1995a;b; 1998). Pragmatic solutions are predicated on the idea that co-referential proper names have the same semantic content, but differ in pragmatic import. More specifically, the proponents of a pragmatic approach argue that ascribing a co-referential but sense-distinct belief to a person is strictly speaking correct, but that it looks incorrect because it is misleading[35]. The alleged reason such an ascription is misleading is that one normally assumes that if a belief is correctly ascribed to a person, that person would agree that having that belief if asked. That is not the case, however, if distinct but co-referential proper names are used in the belief ascription. For instance, it is misleading to ascribe the belief that Phosphorus is visible in the evening to an Ancient Greek because it suggests that the Ancient Greek would assent to having that belief. That is not so, though, as the Ancient

[34] The underlying mistake is arguably to think that natural languages directly relate to extra-linguistic reality, which entails that all expression types that appear in natural languages do so as well.

[35] Whenever a locution such as co-referential belief or co-referential sentence is used, this is meant as a short form for beliefs or sentences that are identical save for one referring expression. For instance, the sentences "Phosphorus is a star" and "Hesperus is a star" are co-referential in this sense.

Greek would only assent to believing that Hesperus is visible in the evening and to believing that Phosphorus is visible in the morning. Even so, the proponent of the pragmatic approach maintains that the ascription is factually correct, as the Ancient Greek does believe of the object variously called Hesperus, Phosphorus or Venus that it is visible in the morning. On the pragmatist view, the factual correctness of the ascription is due to the fact that the proper names Phosphorus and Hesperus have the same semantic content, while its misleading nature is due to the fact that the proper names differ in what they pragmatically imply. The underlying strategy in response to Frege's Puzzle is thus to pragmatically enrich a Referentialist semantics in order to resist Frege's arguments for the necessity of a two-tier semantics. In terms of semantic theory, proponents of a pragmatic response to Frege's Puzzle are thus Referentialists.

As a side note, it is important to note that a Fregean need not deny that there is a certain correctness in ascribing a co-referential belief. The Fregean can accommodate this weaker form of adequacy for belief reports by maintaining that in some contexts, sameness of reference is sufficient, while denying that this is generally the case. In many if not most cases, a Fregean will maintain that only sameness of sense is enough for a belief ascription to be correct. As is well-known, belief ascriptions based on the weaker adequacy condition are called de re belief ascriptions, while the stronger condition is called de dicto. Because both adequacy conditions are appropriate in some contexts, it is sometimes argued that there is an explanatory standoff between Referentialism and Fregeanism: while Referentialism can explain the de re cases well, Fregeanism can explain the de dicto cases well (Gaskin 1997: 144). This is a mistake, however. The crucial point is that Referentialism can only explain the correctness of de re cases, while Fregeanism can explain the correctness of both. The challenge is thus for the Referentialist, including proponents of the pragmatic response to Frege's Puzzle, to account for the exclusive correctness of de dicto belief ascriptions in some contexts.

Taschek's major objection against the pragmatic approach is that the differences pointed out by Frege's Puzzle are of logical significance, because of which they have to be considered a matter of semantics rather than pragmatics:

> "coreferential substitution typically results in a sentence with different logical properties from those of the original - surely a semantic and not a merely pragmatic difference." (Taschek 1998: 324)

The focus in this section is on Taschek's latest response to the Puzzle, as it displays interesting analogies to Semantic Relationism. To make his case, Taschek uses the following example (1998: 325):

(22) Superman is stronger than Clark Kent.

(23) Superman is stronger than Superman.

(24) There is someone who is stronger than himself.

The point of the example is to show that although the proper names in (22) and (23) are co-referential, so that the statements are true in the same worlds, only (23) allows for the logical inference of (24). Even if the truth of (22) entails the truth of (24), it is not logically valid to infer (24) from (22). This logical difference, Taschek contends, has be explained by a difference in content

between (22) and (23), and cannot be explained by a mere difference in what they pragmatically imply. Taschek credits Frege with his basic insight, who, as a mathematician by training, was certainly motivated by logical concerns.

Taschek initially accepts Frege's claim that the logical difference is due to a difference in content. Taschek's aim in his latest contribution is to account for the difference in content by bringing out the semantic import of the logical structure of sentences (1998: 325). Schematically, the logical structure of the sentences is as follows:

(25) S(a;a') for (22)

(26) S(a;a) for (23)

(27) ∃x(x;x) for (24)

As only (23) has the logical structure that mirrors the structure of (24), it explains according to Taschek why (24) can be inferred from (23), but not from (22)[36]. (22) has the wrong logical structure to allow the valid inference of (24). Given that Taschek accepts that Frege's Puzzle points to differences in semantic content, it follows for him that logical structure is a semantic feature of the sentences in question, which exists independently of how they are used, that is, independently of what they may pragmatically imply. (22) and (23) thus have different semantic content in virtue of having different logical features. In addition, the difference in logical structure between (22) and (23) also explains why the substitution of "Clark Kent" for either occurrence of "Superman" in (23) is impermissible, even if both terms are co-referential, as it would result in a sentence with a different logical structure (that of (22) of course). In that case, the validity of inferring (24) would be interrupted. On Taschek's proposal, substitution is admissible only if both reference and logical structure are preserved.

In contrast to Fregeans, Taschek proposes to abandon senses by appealing directly to differences in logical properties. An initial difficulty, however, is that it does not capture the difference in content between the following two statements, as they are schematically equivalent on Taschek's account (1998: 328):

(28) Superman is stronger than Clark Kent.

(29) Clark Kent is stronger than Superman.

The same is also true for the following two statements:

(30) Superman flies.

[36] Interestingly, Taschek leaves it open whether the logical structure is a matter of syntax, which can obviously have semantic import, or semantics, or something different altogether. All he specifies is that logical structure has semantic import. Semantic Relationism is much more explicit in this respect, as it considers the sort of relation logically relevant here, coordination, part of the semantics. The semantic nature of coordination does of course not preclude the claim that it holds in virtue of a syntactic relation. Moreover, if Taschek's view is that the logical structure is a matter of syntax, as seems plausible, his view is clearly reminiscent of the view that the differences pointed out by Frege's Puzzle are differences in logical form. That view is not considered in this thesis, even if Fine does consider it (Fine 2009: 41-42).

(31) Clark Kent flies.

Although both examples fail Taschek's initial criteria for the same reason that they share a logical structure, they differ in important respects and have to be discussed separately. The problem in the first example is that the co-referential terms are transposed, while in the second example the problem is that the sentences contain only one referential term. This section focuses on the first case. The second case, which is an example of a monadic variant of Frege's Puzzle, is discussed in the next chapter on Semantic Relationism, as it is mistakenly considered by some to constitute a counterexample to the Relationist semantics adopted in this thesis.

The most interesting aspect of Taschek's discussion from a Relationist point of view is that he notes that the difference between (28) and (29) becomes logically relevant only when considered with respect to further statements. For instance, from (28) and (30) it is possible to conclude that something that flies is stronger than Clark Kent, which cannot be concluded from (29) and (30), despite the fact that (28) and (29) have the same logical structure. Taschek's offers the following analysis:

> "To understand these differences in logical potential by appealing to a difference in logical structure, we shall need a notion of logical structure that is individuated in a way that is sensitive not only to what expressions occur within a particular sentence, but also to what expressions occur in other sentences"
> (Taschek 1998: 328)

Taschek introduces the notion of a global logical structure to capture the expanded significance of logical structure. This allows Taschek to make the point that although his proposal does not distinguish between the logical structure of (28) and (29), it can still make a distinction between the global logical structure of the overall arguments, that is, between the logical structure of (28) combined with (30) as compared to (29) combined with (30). Put differently, taking an argument to be a set of premises and a conclusion, one can state that the set containing (28) and (30) and the conclusion mentioned above constitutes a logically valid argument, while the alternative with (29) does not. This can be captured by the fact that the two sets of sentences differ in their global logical structure. The difference in global logical structure in turn explains why the substitution of co-referential terms in the sentences included in the argument fails. Even though the substitution of "Superman" with "Clark Kent" in (28) would preserve the logical structure of (28), it is not permissible because it disrupts the global logical structure of the arguments that contain (28). In that sense, (28) and (29) are said to have different logical potential (Taschek 1998: 325).

As Taschek rightly points out, a Fregean can accept Taschek's points so far:

> "A Fregean [...] need have no problem with the idea that a difference in the logical potential of two otherwise referentially isomorphic sentences reflects a difference in their logical structure. She will insist, however, that such differences in logical structure are themselves to be explained by appealing to differences in the senses of counterpart subsentential expressions. In virtue of a difference in their associated senses, the relevant subsentential expressions will make distinct compositional contributions to determining the logical structure and so the content expressed by the sentences in which they appear."

(Taschek 1998: 329)

In contrast to Taschek, Fregeans thus seek to explain the logical difference by appealing to something more fundamental, namely a difference in sense. For this to be successful, however, Taschek notes,

> "[t]he sense-theorist must provide us with a more substantive account of the notion of sense in particular, an account that specifies what difference in sense amounts to independently of an appeal to these very logical differences."
> (Taschek 1998: 329)

In other words, differences in sense have to be explained without appealing to differences in logical form, if else the former cannot be taken to explain the latter. A possible option for the Fregean in this regard is to maintain that senses incorporate modes of presentation, which in turn account for differences in global logical form. Taschek, who endorsed a Fregean sense-theory in previous work, is skeptical (1992, 1995a, 1995b). Therefore, he opts for an explanatory project that is more modest, in analogy to Sainsbury:

> "[..] I have grown deeply skeptical that any satisfactory account of sense capable of playing this kind of explanatory role is likely to be forthcoming. I have come to believe that the whole strategy of attempting to explain puzzling differences in logical potential by appealing to differences in the compositional contribution of counterpart subsentential expressions is misguided. Consequently, the traditional commitment to unrestricted compositionality at least insofar as it is understood to commit one to such an explanatory strategy now strikes me as untenable."
> (Taschek 1998: 330-331)

His suggestion is to add global logical structure as an independent, semantically relevant component of linguistic analysis that is not determined by the senses of the basic constituents of sentences. It is to

> "accord to the notion of logical structure a fundamental status inconsistent with the traditional, sense-theoretic understanding of the explanatory priorities"
> (Taschek 1998: 331)

which is

> "in effect, to accept that the logical properties possessed by a sentence, on a given occasion of use, are to a certain extent autonomous from the semantic content possessed, on that occasion, by the individual subsentential expressions making it up"
> (Taschek 1998: 331)

It is striking to note, though, that Taschek here seems to depart from his view as presented earlier. Initially, Taschek argues that in order to accommodate Frege's Puzzle, a semantic theory needs to posit more than just referential content, which he suggests is global logical structure (Taschek 1998: 329). He adds that this structure cannot be explained by the semantic contribution of subsentential expressions, as a sense theory assumes. At this point, however, Taschek states that what is needed in addition to referential content is independent of the semantic content and changing with the use of a sentence, which clearly suggests pragmatic rather than semantic factors[37]. With respect

[37] See (Taschek 1998: 338) as well.

to Semantic Relationism, this shift is crucial. The central idea of Semantic Relationism is the idea that certain phenomena as highlighted by Frege's Puzzle are explicable only by means of semantic features that are not intrinsic to individual expressions and sentences. The attention Taschek initially pays to global logical structure suggests that he thinks along similar lines. Yet by appealing to the autonomy of the relevant features from semantics and by stressing their occasion-relative nature, Taschek indicates that he is ultimately inclined more towards a pragmatic account.

At any rate, Taschek accepts that his account is compatible with a Fregean semantics if senses are not taken to explain differences in logical potential, but differences in logical potential are instead taken to provide the basis for ascribing sense differences. An advantage of this view according to Taschek is that it allows for a individuation of senses that is less-fine grained than, say, a conception of senses as modes of presentation. This avoids a fineness of grain problem that can arise if a theory is forced to individuate senses more and more finely to account for sameness of sense, and thus logical potential, in some cases, which then leads to a conception of senses that is so fine-grained that the theory loses the ability to explain sense-identity, and hence logical potential, in other cases (Taschek 1998: 332). This problem arguably affects the classical Fregean view on which senses are, or contain, modes of presentation. Modes of presentation have to be fine-grained enough to be able to differentiate distinct concepts intrasubjectively, but not so fine-grained that they are no longer adequate to identify concepts intersubjectively. The advantage Taschek sees here over classical Fregeanism is closely connected to Sainsbury's claims that senses are not modes of presentation and that a semantic theory needs a relation of sense-identity rather than senses as such. The explanatory modesty inherent in both theories absolves the theorist from providing a more specific conception of the semantically relevant notion, be it sense-identity or logical potential. Sainsbury's proposal has two major advantages, however. First of all, it is specific about what the notion of content in addition to reference is and how it relates to classical senses. Secondly, it makes its additional notion, sameness of sense, applicable to two expressions at a time, rather than making it a fully global property, as Taschek does. The reason why this is in fact a major advantage is explained in a moment.

As seen, Taschek's view is "guided by a complex combination of semantic and pragmatic considerations" (Taschek 1998: 338). How precisely is the global logical structure of a set of sentences to be understood then, given that it is independent of the semantic contribution of the individual sentences contained in the set? Rather than addressing that question, Taschek proposes to focus on how global logical structure is assigned:

> "The issue, more generally, is what considerations determine whether or not a particular assignment of logical structure to a sentence, or collection of sentences, on a given occasion of their use, is correct? The answer, simply put, is: nothing more nor less than the sorts of consideration that determine in general the correct interpretation of speech."
> (Taschek 1998: 332)

This claim is again comparable to Sainsbury's idea that sameness of sense does not explain the correctness of reports of speech, as it is rather the obvious correctness in such cases that justifies the assumption that sameness of sense holds. Taschek's account is thus motivated by the same explanatory modesty, which has already been criticized in the previous section. However, Taschek faces and additional difficulty here. The problem is that his explanation misses the point, as it

explains why and how we ascribe differences in logical structure, but the real issue is to say what is ascribed that accounts for the difference in logical form. It is one thing not to accord too much explanatory power to what one ascribes, as Sainsbury does in the case of sense-identity, but it is another thing not to even say what it is ascribed in such cases. Taschek invokes considerations of logical charity at this point, which consist in maximally "making sense of [people] qua rational agents" (1998: 332-333). That, however, is a principle that guides an explanatory project seeking to determine why a certain logical structure is ascribed in a given case, but what is required in terms of semantic theory is a determination of what is ascribed under the guidance of the principle of logical charity. A satisfactory theory, at least to extent that it is based on the idea that logical form is part of the semantics of a language, has to provide some indication of what is ascribed, as Sainsbury does with his sense-identity relation and Fine with his semantic coordination. Arguably, Taschek's explanatory project is thus too modest. Having sensibly rejected the demand for a semantic notion with substantial explanatory power, he proposes an account that offers no such notion at all.

A brief comparison with Semantic Relationism should help to clarify this point. The two distinctive aspects of Taschek's proposal relevant in this regard are his distinction between local and global logical structure, and his claim that global logical structure is independent from the local logical structure, and the semantic content more generally, of the individual sentences that jointly possess the global logical structure. Semantic Relationism operates with an analogous distinction, albeit one that is incorporated into the semantic theory in a much more straightforward way. The distinction is between intrinsic and extrinsic content, which can be explained as follows. For the Relationist, proper names such as "Superman" and "Clark Kent" have the same intrinsic content. On the one hand, this means that they have the same reference, but on the other hand, it also means that considered individually, they do not otherwise differ in semantic content. The reason is that on a Relationist semantics, reference is the only intrinsic content of proper names. This contrasts with Fregeanism, which is based on the assumption that proper names have both sense and reference as intrinsic content. In contrast to the Referentialist, however, the Relationist shares with the Fregean the view that both proper names differ in content, because the proper names are taken to differ in extrinsic content, which is to say that they differ in how they relate semantically to other occurrences of expressions. Importantly, the notion of extrinsic content is not supposed to be explanatory, however. It is rather an abstraction from claims about how expressions are semantically coordinated, which cannot be explained on the basis of their intrinsic content. Hence, to state that two proper names differ in extrinsic content is just another way of saying that they are not coordinated. In fact, the very point of making the semantic difference between co-referential proper names an extrinsic difference is to highlight that it cannot be explained by appealing to the intrinsic semantic features of those expressions.

An example should make this clear. For the Relationist, coordination explains why, say, the identity statement to the effect that Superman is Superman differs semantically from the statement that Superman is Kent. The reason is that in the first statement both occurrences of the name used to refer to Kent are coordinated, which is not the case in the second statement. Another way to say this is to maintain that the proper names "Superman" and "Kent" do not have the same extrinsic content. As mentioned, it is crucial to keep in mind that semantic coordination is the primary notion, which is to say that a difference in extrinsic content does not explain a difference in coordination, but rather the other way around.

The three key components of this view are, first, the distinction between intrinsic and extrinsic features, second, the independence of the extrinsic features from the intrinsic ones, and third, the idea that these features are part of the content of expressions. Plausibly, the first two distinctions are reflected in the claims Taschek makes about logical structure. The major difference lies in the third point. While Taschek is unclear about how his global logical structure relates to semantic content, the Semantic Relationist is clear that the relevant extrinsic features are part of the semantic content of expressions[38].

The fact that Semantic Relationism is explicit about the semantic nature of its notions of coordination and extrinsic content is particularly interesting for the following reason. On the one hand, Taschek's major line of argument has always been that the differences highlighted by Frege's Puzzle have to be semantic given that they are of logical importance (1992: 768). In his latest paper, he reemphasizes this point (1998: 324). On the other hand, Taschek seems unable to accommodate this requirement into a semantic theory, which leads him to appeal to pragmatic factors, despite his own arguments against doing so (1998: 338). Hence, it seems as though Semantic Relationism in fact offers the semantic theory that Taschek is looking for.

It follows that even though Taschek does not draw explicitly Relationist conclusions, he provides a core motivation for such a view by rejecting the intrinsic nature of whatever is needed in addition to reference, while at the same time endorsing its semantic nature. This contrasts with a classical Fregean approach, which is based on the idea that all differences in semantic content are due to differences in intrinsic content. Hence, Taschek and the Relationist agree that some relational differences in content cannot be derived from differences in intrinsic content. Moreover, Taschek points out that this relieves him of the burden of explaining how the intrinsic features of expressions such as proper names can explain difference in their logical potential (1998: 332). A similar point holds for Semantic Relationism as well. By introducing the coordination relation as a semantic primitive into the semantic theory, the Relationist is no longer required to account for cases of coordination on the basis of shared intrinsic features, such as a shared mode of presentation. This shields the theory from the well-known failures of the attempts to provide such an intrinsic basis, as evidenced by the view that senses are modes of presentation. The root cause for this failure is plausibly the wide range of factors that can determine the relevant identity in different cases[39].

The aim in the remainder of this section is to point out some further important similarities and

[38] It should be noted that whether a semantic feature is intrinsic or extrinsic is expression-relative. Coordination is part of the intrinsic content of a sentence if it is either intrinsic to one of its constituents or if it holds between two of its constituents. For example, the coordination between both occurrences of "Superman" in "Superman is Superman" is part of the extrinsic content of the individual occurrences of "Superman", but it is part of the intrinsic content of the sentence. That way, the extrinsic content of one expression can be the intrinsic content of another that contains it.

[39] It should be mentioned here that the current proposal relies much more heavily on the notion of extrinsic content than Fine does. Fine's reluctance is perfectly justified as the notion carries the risk of implying that extrinsic content explains or accounts for coordination, which is not the case. Extrinsic content is nothing more than an abstraction of relational content on the level of individual expressions. The proposed account fully accepts this explanatory order. The notion just seems helpful when comparing the Relationist approach with the alternatives considered here. So to reiterate, extrinsic content is always an abstraction from a higher (syntactically more complex) level on which that content is intrinsic. Evidently, these higher contexts are possible rather than actual contexts. For example, the mere possibility of conjoining in one statement or belief some person A's belief that Hesperus is a star with some person B's belief that Phosphorus is a star, and the fact that there would be no coordination in such a conjunction, is the basis for the claim that both proper names in the actual beliefs have different extrinsic content. On the other hand, this is not to suggest that it is always determinate and knowable whether two expressions have the same extrinsic content. More on this later.

differences between Taschek's proposal and Semantic Relationism, before considering Taschek's discussion of a very important variant of Frege's Puzzle due to Kripke. A first observation is that like Fine, Taschek is aware that the rejection of Intrinsicalism, which is the doctrine that content is always intrinsic, necessarily amounts to a restriction of compositionality:

> "I have come to believe that the whole strategy of attempting to explain puzzling differences in logical potential by appealing to differences in the compositional contribution of counterpart subsentential expressions is misguided. Consequently, the traditional commitment to unrestricted compositionality at least insofar as it is understood to commit one to such an explanatory strategy now strikes me as untenable."
> (Taschek 1998: 331)

Fine makes this idea more precise:

> "Compositionality, as it is usually formulated, must now be given up. For the "meaning" (or semantic value) of an expression [...] will not in general be a function of the meanings of its component expressions [...]. But compositionality, more generally conceived, will still hold. The meaning of an expression E will still be a function of the meaning of the component expressions [as long as this is...] construed collectively so as to include the meaning relationships among the different components and not just their individual meanings [...]"
> (Fine 2009: 26)

Fine distinguishes this residual principle of compositionality, which he calls "compositionality proper" from a commitment to Intrinsicalism, and claims that in Semantic Relationism, "[...] it is only Intrinsicalism that is given up, not compositionality proper" (2009: 26). It is plausible to assume that Intrinsicalism is precisely what Taschek is willing to give up as well, as it carries with it the explanatory burden he rejects. In this respect, Fine's Semantic Relationism is simply a theoretical elaboration of Taschek's basic ideas[40]. Fine's semantic theory thus has the advantage of being more precise, but there is a more substantial difference between the two approaches as well.

A fundamental difference between both approaches is that Taschek starts from a very high level over and above individual expressions. The global logical structure is, as the name clearly reveals, a global property, that is, a property of a global set of sentences. The reason this has to be the case is that in order to ascertain whether two sentences differ in logical potential, one ultimately has to consider them in relation to all other sentences. Moreover, the sentences that are relevant for ascertaining logical potential cannot be only those sentences that concretely exist, but it must include all possible sentences, as substitution is impermissible even if there is currently no concrete sentence token that shows that the global logical structure has been disrupted. To see this, one can imagine a scenario in which there are two distinct but co-referential names, which, by sheer coincidence, occur only in concrete sentences that say exactly the same. In other words, there is no concrete sentence that states something about the reference using one name for which there is no corresponding sentence that says the same using the other name. Moreover, again by chance, there is no concrete sentence that contains both names at the same time. It is clear that even in that scenario, it should not be permissible to substitute between both names for the reason that it

[40] To reiterate, Fine has mentioned in personal conversation that he was not aware of Taschek's work, so the claim here is not that it constitutes an actual point of origin of Fine's semantic theory.

violates the requirement on preserving global logical structure, even if there is no concrete sentence that would showcase the disruption. The mere possibility of constructing an argument of the type exemplified by sentences (22) to (24) above is sufficient to show that sentences that contain different co-referential name but are otherwise identical do not have the same logical potential.

Another way to make this point is to maintain that the global logical structure is a matter of sentence types rather than tokens[41]. The reason is that the set of sentence types represents the set of possible sentences, as determined by the set of possible constituents and the rules of the combinatorial syntax. The global logical structure then is the logical structure of the set or collection of all sentence types, which alone is sufficient to determine the logical potential of individual sentence types and tokens. The worry then is that on account of this, Taschek's approach is committed to the existence of a universal set of sentences, positing which leads to a well-known contradiction made familiar in philosophy by Russell (Klement 2003). The problem is that the assumption of a universal set of sentence types violates Cantor's principle that every set always has more subsets than members, because for sentence types, as for propositions, it is always possible to construct a sentence for each subset, for instance a sentence type to the effect that a particular subset is a set. Accordingly, one has to admit that there are least as many members as subsets in the universal set of sentence types, in violation of Cantor's principle. It follows that the set of all sentence types cannot exist, which in turn entails that there is no global logical structure, as Taschek maintains.

To be sure, in the cases Taschek discusses, the set of sentences under consideration is always restricted to a relevant set, for example all the premises and the conclusion in a specific argument. The examples Taschek uses are therefore unproblematic. That does not change the fact, though, that Taschek is ultimately committed to a top-down strategy, where the sub-global logical structure relevant for a specific argument is derived from the logical structure of a more comprehensive set of sentences, up to the logical structure that is truly global. And that entails a commitment to the logical structure of an entity the existence of which cannot be posited without contradiction. Since there cannot be a universal set of sentence types, it cannot have a logical structure, and hence there is no global logical structure.

In stark contrast, the Relationist starts on a much lower level for its secondary notion of content. In fact, the Relationist starts at the lowest level possible, which is the second-lowest level there is, one level above the bottom level that contains the basic constituents of a language. Evidently, Semantic Relationism is precluded from starting at the very lowest level by its rejection of intrinsicalism. To be more precise, the Relationist considers coordination a semantic property of expression pairs. Starting with those pairs, the Relationist then works semantically bottom-up. Structures of higher linguistic complexity, such as arguments, are taken to differ semantically and thus logically if some respective pairs of expressions they contain differ in how they are coordinated. Hence, these arguments are taken to differ in what Taschek would call their global logical structure by reason of containing as constituents pairs of expressions with distinct semantic values. As a result, the explanation from pairs of expressions to higher-order structures such as arguments works along classical compositional lines. This is the sense in which Fine upholds "compositionality proper" based on expressions "construed collectively" (Fine 2009: 29). As a result, a difference between the global logical structure of two arguments holds because of a difference in semantic value between

[41] The assumption here is that sentence types are abstract objects like numbers that exist independently of their tokens.

two relevant pairs of expressions that are the semantic constituents of these arguments. To give a concrete example, it was mentioned that from (32) and (34) it is possible to conclude that something that flies is stronger than Clark Kent, which cannot be concluded from (33) and (34):

(32) Superman is stronger than Clark Kent.

(33) Clark Kent is stronger than Superman.

(34) Superman flies.

Unlike Taschek, the Relationist is able to explain this difference compositionally by appealing to a difference between the semantic content of the expression pair "Superman" and "Superman" in the case of (32) and (34), which contains two expressions that are semantically coordinated, and the corresponding expression pair "Superman" and "Clark Kent" in (33) and (34), which contains expressions that are not coordinated[42].

Now perhaps Taschek can avoid the contradiction mentioned above by maintaining that no truly global structure is required, as the relevant logical structure is always derivable from a more comprehensive yet finite subsets of sentences. However, even on the assumption that such a response is viable, it is important to note that Semantic Relationism has clear advantages. The reason is that it offers a theory on which the problem does not arise, and which makes it evident why it does not. Taschek's proposal, in contrast, can at best be mended in an ad hoc way to avoid the problem, which evidently does nothing to explain why the issue is not a concern. Alternatively, Taschek can adopt a similar strategy as the Relationist. He can opt for a similarly minimal approach that posits logically relevant relations between expression pairs rather than making it a matter of global logical structure. That, together with the close connection between between logic and content that Taschek makes, would clearly yield a theory on a par with Semantic Relationism. The reason, however, is evidently that it would be nothing else than a Relationist semantics. Hence, it appears as though Semantic Relationism is the result of solving Taschek's difficulty in this respect in a way that is both theoretically and explanatorily satisfactory.

Taschek's approach faces another problem that is easier to see. Taschek holds that belief ascriptions are adequate if they "systematically reflect the logically relevant features of the beliefs we take ourselves to be reporting" (Taschek 1998: 333). For instance, suppose a person believes the following:

(35) Superman is a star and Superman is nice and thus there is a nice star.

In that case, the person should not be reported as believing the following:

(36) Superman is a star and Clark Kent is nice and thus there is a nice star.

Doing so would obviously not adequately reflect the logical structure of the belief ascribed. Fine

[42] It should be mentioned that this is the understanding of a Relationist Semantics defended in this thesis. Whether this is exactly Fine's understanding as well is not entirely easy to determine. In his (2010b), Fine introduces the notion of tertiary content to capture coordination between propositions. On the current proposal, such an additional notion would seem dispensable.

points to an important distinction between a weak and strong version of de dicto ascription adequacy, however (Fine 2009: 103). The weak reading captures the requirement imposed by Taschek here. It asks the ascriber to respect the internal logical structure of the belief ascribed. Fine stresses that sometimes we impose a stronger requirement on adequate reporting. The weak de dicto criterion allows for the initial belief to be adequately ascribed as follows:

(37) Clark Kent is a star and Clark Kent is nice and thus there is a nice star.

The reason is that (37) perfectly respects the internal logical structure of the actual belief held by the person in question. Yet in certain contexts, a belief ascriptions is adequate only if the right name is used, in which case it is not permissible to use the name "Clark Kent" to ascribe beliefs the ascribee himself or herself would describe by using the name "Superman". Using Relationist terminology, the stronger de dicto requirement asks the ascriber not only to respect intrasubjective coordination, but also intersubjective coordination, which is coordination between the proper names as used by the ascriber and the ascriber of a belief. Hence, the stronger requirement no longer accepts as adequate a belief ascription if it makes use of a proper name that is uncoordinated with the proper names used by the ascribee, even if it perfectly respects the logical structure of the belief ascribed. In Taschek's terminology, the weak de dicto amounts to restricting the "global" logical structure to the ascribee, while the stronger notion captures the "global" logical structure that encompasses both the ascriber and the ascribee, thus taking into account how their relevant beliefs relate to each other[43].

The problem then is Taschek's view on how global logical structure is determined. The crucial issue here is what the underlying aim of determining and preserving the global logical structure of sentences or beliefs is. The answer, according to Taschek, is that by preserving global logical structure one tries to achieve the "correct interpretation of speech" (1998: 332), for which one uses a principle of charity that is "rationality-constrained" in that it looks for an "optimally rational pattern" and tries to "correctly identif[y] the logical properties of the sentences" (1998: 333). Not surprisingly then, the principle of charity underlying the determination of global logical structure is motivated purely by logical concerns. The principle requires that one regards other as maximally rational, which entails that one does not ascribe to them beliefs in a way that is obviously fallacious from a logical point of view. The problem is that rationality is necessarily limited to individual subjects, as it is only within individual subjects that logical inconsistencies are irrational. While it is irrational for one person to think that, say, Superman is and is not strong, it is not irrational for two persons to believe one of those each, so that they jointly believe both. There is an obvious difference between disagreement and irrationality in this regard. As a result of this, Taschek's guiding principle of logical charity only yields the weak de dicto. The following observation highlights this point. If all proper names in a person's beliefs are systematically substituted for a co-referential alternative, the substitution necessarily preserves the logical structure of the beliefs. The stronger version of de dicto ascription requires more, however, and therefore it cannot be motivated on the basis of logical concerns. So while Taschek's account has the theoretical tools to describe the stronger de

[43] Alternatively, it encompasses the belief of the ascribee and the belief ascription. As mentioned, the current proposal is based on the idea that there is always an underlying belief for each ascription, so that the distinction does not really matter. The reason it is preferable to speak purely about beliefs here is that else it may seem to suggest that natural language sentences have semantic content, which is not the case on the current proposal, on which only sentences in the Language of Thought, which are constitutive of beliefs, strictly speaking do.

dicto version by considering a larger set of beliefs that encompasses both ascriber and ascribee, it is not covered by his motivating principle of rationality. In other words, given how Taschek motivates global logical structure, it cannot accommodate cases of strong de dicto belief ascriptions[44].

To resist this point, one could argue on behalf of Taschek that one can restore the role of rationality to account for strong de dicto cases by appealing to a larger set of beliefs of the ascribee. For instance, one could point out that while the substitution of "Clark Kent" for "Superman" may preserve the argument-like belief described above, it does not preserve the overall rationality in the belief system of the ascribee. The reason is that the subject has additional beliefs, to the effect, say, that Superman can fly, but that Clark Kent cannot. As a result, the inference to there being a flying star would be disrupted, which could make some behavior look potentially irrational, in contravention to the principle of logical charity. This strategy fails, however. The reason is simply that one could replace all "Superman" occurrences with "Clark Kent" in the ascription of the beliefs of a person, and vice versa. This will preserve the actual logical consistency of the overall belief set of the ascribee as a matter of necessity, but it will still not be strongly de dicto adequate. Hence, even an ascription that is necessarily ideal in terms of the principle of rationality can fail to be strongly de dicto adequate, which shows that strong de dicto belief ascriptions are about more than logical acumen and rationality. As a result, Taschek's claim that the global logical structure "provides the ultimate semantic basis for the general invalidity of coreferential substitution in the content clauses of attitude ascriptions" is incorrect, as it fails to exclude the possibility of universally and consistently switching all co-referential expressions (Taschek 1998: 333).

1.2.3.1 Kripke's Puzzle

The final section is concerned with Taschek's discussion of Kripke's Puzzle, which is an ingenious version of Frege's Puzzle developed by Kripke (1979)[45]. A crucial feature of a Kripke case is the assumption that an ascribee has conflicting beliefs about what he or she thinks are two persons, while the ascriber knows there is just one. The famous example provided by Kripke is of a subject called Peter who encounters a Pole named Paderewski twice, once playing a musical concert, and once speaking on a political event, but fails to realize that it is the same person on both occasions. Unlike Peter, the ascriber of the beliefs does know that Paderewski is the same person on both occasions. The following then are adequate ascriptions of what Peter believes, assuming that Peter believes that all politicians are unmusical[46][47]:

(38) Peter believes that Paderewski is musical.

(39) Peter believes that Paderewski is not musical.

[44] Since de dicto belief ascriptions are often taken to imply the assent of the ascribee, the terminology "weak de dicto" used by Fine is admittedly not ideal, as the ascribee would presumably not assent to such an ascription. It would perhaps be better to call it it "strong de re", as it requires, in contrast to "normal" or "weak" de re adequacy, which requires only co-reference, sameness of logical structure. This terminology is not adopted here, however, so as not to needlessly complicate matters even further.

[45] The discussion is rather summary here as what is taken to be real challenge raised by Kripke, namely the non-transitivity of the notion that underlies the identity of content, is discussed later on.

[46] Another familiar aspect of Kripke's Puzzle that is crucial is that the same name is used twice, which shows that the Puzzle cannot be solved by appealing to a phonological difference in name.

[47] Kripke's most famous case about Pierre and his beliefs about London is not discussed, mostly because it raises additional questions about translation that are irrelevant to the core problem raised by the Puzzle.

From this, it follows:

(40) Peter believes that Paderewski is and is not musical.

Kripke then presents the reader with a dilemma. If one accepts (40), one in fact ascribe a serious logical error to Peter, as it ascribes to him a belief that is obviously contradictory. Yet one can assume that Peter is logically very astute, so that he never believes an obvious contradiction[48]. Hence, (41) is also true:

(41) Peter does not believe that Paderewski is and is not musical.

Statement (41) is true in that Peter believes of neither Paderewski he encounters that he is musical and not musical at the same time. Given (40), however, there is a contradiction. Since (41) has to be kept, (40) has to be rejected. But if one rejects (40), one has to reject at least one of (38) or (39), which amounts to accepting that that particular belief ascription is incorrect[49]. This results in the following dilemma: one either takes Peter to be irrational or one accepts that one of the ascriptions (38) and (39) is incorrect. Intuitively, either option is highly problematic, which Kripke confirms with a lengthy discussion in his paper (1979). Kripke's arguments are not a major concern here, however, as the primary aim is to understand Taschek's proto-Relationist response. So what is Taschek's suggestion?

Taschek approaches the problem by pointing to the sensitivity of adequate belief ascriptions to global logical structure. Against Kripke, he contends that one unquestionably accepts both (38) and (39) only if and because they are presented one at a time, which is why only their local logical structure is taken account in the assessment of their accuracy. However, as soon as (40) becomes salient, from which the contradiction can be derived, this changes. Once (40) is a relevant option, and it can be seen that it results from putting the individual commitments to (38) and (39) together, one takes notice of the global logical structure of the result, which then leads to the retraction of the previous commitments that, individually, were accepted without reservation. So according to Taschek, the paradox arises because the belief ascriptions are first considered and motivated individually, and only then considered together to yield (40). Taschek maintains, however, that the commitment to (38) and (39) individually should not ipso facto be taken to a commitment to (40) (1998: 336). For Taschek, refraining from endorsing (40) while accepting both (38) and (39) is in fact not irrational because the initial commitments were based on the logical structure of each individual statement, while the reluctance to endorse (40) is based on the global logical structure of all three statements taken together. In other words, one is willing to commit to (38) only when disregarding (39), and vice versa, which means that one accepts either one as long as it does not entail a commitment to (40) at the same time. While each belief ascription is uncontroversial if considered individually, it is for Taschek not all obvious that this amounts to an uncontroversial acceptance of their conjunction.

[48] Kripke famously states that he is a "leading philosopher and logician", who "lacks information, not logical acumen" (1979: 256).

[49] And if (39) is replaced by a statement to the effect that Peter does not believe that Paderewski is musical, which is warranted as it follows from of (39), one even gets a contradiction in the ascriber. Peter is then taken at the same time to believe and not to believe that Paderewski is musical, which is to believe something of the form p and not-p. This aspect of the Puzzle is not considered here.

Although this represents a decent analysis of what is puzzling about Kripke's case, it is hardly a solution. It explains what is problematic about the case, but the harder question is what conclusions have to drawn from this in support of the analysis that Taschek suggests. In other words, how is it, semantically speaking, that one is evidently willing to commit to (38) and (39) individually, but not to both together?

In line with Taschek's general view that a decent solution to the Puzzle has to be semantic in nature, one clearly expects Taschek to offer a semantic theory that can adequately describe the situation at this point, a semantic theory, that is, which underwrites the analysis he offers. One expects Taschek to address the following question: what is the semantic content of the belief ascriptions and Peter's beliefs such that the proposed analysis is the correct analysis[50]? How can we explain, in semantic terms, that the global logical structure is such that it disallows the inference of (40) from (38) and (39)? Surprisingly, though, this is not what Taschek offers. Instead, he thinks one must appeal to pragmatic factors (1998: 338). As mentioned, this is to follows a path Taschek himself as argued against extensively (1998: 345-346, see also his 1992, 1995a, 1995b). Taschek's basic contention then is that while each ascriptions is correct and both proper names have the same content, the names are pragmatically different:

> "we may [...] recognize a pragmatic need to gloss our different uses, offering, for example, something like, '...Paderewski (thought of by Peter as a statesman but not a musician)...' in one case, and'...Paderewski (thought of by Peter as a great pianist but not a statesman)...' in the other. These parenthetical remarks, however, should not be thought of as offering more fine-grained specifications ofthe contents of the particular beliefs we intend to be attributing. Rather, they should be viewed (if proffered at all) as conversational aids [...]"
> (Taschek 1998: 345-346)

The reason Taschek does not want this gloss to be part of the content is the familiar worry that it would individuate the contents of names too finely. In this specific case, it would also mean that the two homophonic yet different names (which are different in the sense that they have different content) are used by the ascriber in (38) and (39), if else they would not correctly render Peter's beliefs, but that contradicts the assumption that the ascriber has only one name for Paderewski. According to Taschek, however, the pragmatic difference between both names is sufficient to block the inference to (40), presumably because it cannot be upheld in (40), in which the proper name occurs only once. That way, the inference can be blocked without giving up the assumption that both proper names differ in terms of semantic content.

The proposed solution is unsatisfactory, however. If both "Paderewski" tokens used in (38) and (39) differ only pragmatically and not semantically, the inference to (40) should be correct, even if misleading. By Taschek's own account, inferences that are free of semantic error are correct, even if they can be misleading when they are pragmatically infelicitous. So on Taschek's proposal,

[50] The assumption here, for the sake of simplicity, is that a belief ascription is correct if the relevant sub-part of the ascription has the same content as the belief in question. A comprehensive semantic account regarding this clearly raises some tricky questions, for instance about how much syntactic correspondence is needed, and is therefore likely to be more complex than what is suggested here. Even so, it is plausible to assume that the basic idea is right. A nice feature of the Language of Thought hypothesis is of course that it allows for a very close similarity between belief ascriptions, taken as linguistic entities of specific languages, and beliefs, which are mental states, as it takes the latter to be sentential in structure as well. If one adds to this the view that in fact only beliefs have content, the problem becomes even more manageable.

it is strictly speaking correct to ascribe a logically contradictory belief to Peter, and the problem is merely that it is deceptive, presumably because it makes the contradiction obvious, which it is not for Peter. This analysis, however, is mistaken. Peter does not believe a logical contradiction, neither an apparent nor a unapparent one, because he believes of one person that he is musical and of what he takes to be another person that he is not. Hence, the problem is not that Peter's beliefs are contradictory in a way that is not obvious, the problem is that they are not contradictory at all. And this is the case even if they cannot possibly be all true. As Kripke puts it, the problem is that Peter "lacks information, not logical acumen" (1979: 256). That Peter's beliefs are not contradictory is shown by the fact that Peter could not discern the falsity of his beliefs by logical methods alone, which he should be able to do if it where a genuine logical contradiction[51]. What Peter needs is the empirical knowledge that the Paderewski seen on both occasions is the same person. Since he does not possess that piece of knowledge, he is in principle unable to discern the contradictory nature of his beliefs. It is therefore incorrect to ascribe a contradictory belief to Peter, and not merely misleading.

An additional problem of Taschek's proposal is that by appealing to pragmatic factors, the proposed "solution" is limited in an unacceptable way. If one focuses merely on what the ascriber believes, rather than what he or she asserts or utters, one can see that the same difficulty raised by Kripke arises as well. The challenge is thus to correctly describe the content of the beliefs of the ascriber in such cases, independent of what he or she might or might not assert. Without an actual conversation, however, there are no pragmatic factors to appeal to in order to account for the differences highlighted by the Puzzle. The proper names in the belief of the ascriber can then not be taken to differ only pragmatically to reflect the fact that they differ from the perspective of the ascribee. It seems evident, however, that the underlying problem is the same whether the belief ascriptions or the underlying beliefs of the ascriber are considered, which suggest that an adequate solution has to work for both. Since appealing to pragmatic factors does not work in the case that considers only beliefs, this seriously calls into question the overall pragmatic strategy.

As a matter of fact, Taschek is well aware of the problems of pragmatic approaches to Frege's Puzzle, as he has developed them himself over the years (1992, 1995a, 1995b). This raises an obvious question. Why does Taschek choose a pragmatic account despite his own arguments against them (Taschek 1992: 779-780)? The analysis suggested by this thesis is that without the theoretical tools provided by Semantic Relationism, Taschek is unable to consistently maintain the various claims he realizes are reasonable. Hence, it is the lack of appropriate semantic tools that leads him to endorse a pragmatic approach which in fact he knows to be untenable. The underlying reasoning is roughly as follows. Initially, Taschek sees that a case can be made that all variants of Frege's Puzzle, Kripke's version included, have to be solved semantically. Hence, Taschek holds that the Puzzle involves "sentence[s] with different logical properties [...] - surely a semantic and not a merely pragmatic difference" (1998: 324). He also agrees that what Frege shows is of "genuine semantic, as opposed to merely pragmatic, significance" (1998: 332). At this point, however, Taschek realizes that Kripke's variants show that a Fregean solution is not feasible[52]. Taschek thus concludes that for want of a better solution, a pragmatic solution has to be accepted after all,

[51] Here it is assumed again, with Kripke and Taschek, that Peter does not lack logical acumen.

[52] The thesis confirms this, as Frege's solution is based on the identity of an intrinsic feature, namely sense, because of which it is necessarily transitive. Kripke's version of the Puzzle requires a non-transitive relation, however, which Semantic Relationism provides in the form of semantic coordination, which can fail to be transitive. More about his later.

despite its drawbacks.

This thesis shows that this reasoning is faulty as it only looks at Fregeanism for a possible semantic solution. The underlying assumption is that if Fregeanism fails, no semantic solution is possible, so that a non-semantic solution is required. Semantic Relationism, however, constitutes an alternative semantic option, which in fact provides what Taschek aims for: a semantic theory that can describe the semantic facts suggested by Taschek's analysis in a non-contradictory way. Semantic Relationism offers a purely semantic solution to the Puzzle that allows each individual attribution (38) and (39) to be semantically correct while nonetheless blocking the inference of (40) without appealing to pragmatic factors. That way, it offers an solution to the Puzzle that is semantic, as well as systematic, consistent and universally applicable, or so it is argued. Suffice it to say at this point that the basic insight that enables this Relationist solution is the idea that the problem requires a notion of sameness of meaning or content that can fail to be transitive, which the theory provides with its coordination relation (Fine 2009: 119). That way, it is possible to maintain that the unique proper name for Paderewski of the ascriber is coordinated with both the distinct proper names of the ascribee, without thereby being committed to the claim that these two distinct proper names are coordinated as well. An interesting corollary of this is that it shows that transitivity failures are the real hallmark of Kripke's variants of Frege's Puzzle, which highlights what is really Kripke's substantial philosophical contribution to semantic theory over and above Frege. While Frege shows that the content of proper names is more than just reference, Kripke shows that what is more should be a relation that can fail to be transitive. Semantic Relationism incorporates both insights. Before providing the details of a Relationist semantics, however, first a brief discussion of Macia's deliberations on the role of coordination.

1.2.4 Macia's Coordination

The purpose of this section is to highlight some interesting Relationist ideas in a little known paper by Macia (2004). As before, the focus is on select aspects of the paper chosen for their ulterior relevance. The choice does not necessarily reflect the priorities of Macia, but the points made against Macia remain accurate.

Macia's proposal relies heavily on Kripke, especially Kripke's notion of communicative chains (Kripke 1972: 91). Kripke's fundamental idea is that for a speaker to use a proper name correctly, he or she does not need to have an adequate and unique description of the reference of the name, but only needs to stand in the right causal-historical chain of uses of that name. By using a proper name, a speaker automatically refers to the person or object that was baptized with that name at the beginning of the chain of name uses[53]. Against descriptive Fregeans, Kripke holds that a proper name refers to a person not because it has a description as its content that fits the person, but because the name is connected via a causal chain of name uses to an initial baptism of the person. Kripke's chains are therefore of meta-semantical nature. They explain non-accidental co-reference, but unlike Fregean senses, they are not part of the content of names.

The reason Macia's paper is relevant for Semantic Relationism is clear from the first sentence:

[53] Problems with Kripke's proposal, such as Evan's "Madagascar" example, are not discussed here (Sainsbury 2002: 220).

> "The main of this paper is to present a certain notion - that of coordination - and an associated requirement - the coordination requirement (CR) -, and to show how they help us to better understand the communicative role of proper names."
> (Macià 2004: 129)

That way, Macia is the first to invoke the notion of coordination explicitly to solve Frege's Puzzle[54]. An obvious question this raises is how Macia understands coordination. Before considering this, it should be noted that Macia appeals to coordination to defend a version of descriptivism (2004: 132). Hence, for Macia coordination relations are not supposed to dispose of the idea that proper names have descriptions associated with them. Accordingly, a substantial part of the paper is taken up by his attempts to defuse anti-descriptivist arguments, mostly due to Kripke. These arguments are ignored here, however, for two reasons. Firstly, Macia's proposal is not descriptivist in the classical sense, as for him descriptions determine reference without being part of the content of proper names (2004: 134-135). Hence, Macia's descriptions play a similar meta-semantic role as Kripke's causal chains. Insofar as Kripke's real aim is to exclude the view that proper names have descriptive content, however, Macia does not really refute Kripke but rather accommodates his arguments, resulting in a view that someone entirely convinced by Kripke could accept. The second reason is the familiar one that the priorities lie elsewhere. The focus is on Macia's understanding of coordination, and the role he thinks it has for semantic theory and the theory of communication.

First, however, a brief note on how Macia intends to defend descriptivist intuitions by appealing to coordination. According to Macia, proper names have descriptions associated with them that fix their reference, but these descriptions are not part of the semantic content of proper names[55]. Crucially, as descriptions are no longer part of the semantic content of proper names, they are not part of what is communicated in conversation by means of a proper name. A major benefit of this view is that it allows the associated descriptions to vary between speakers. It is no longer necessary that all users of a name associate the same description with a name. The only necessary condition is that all the descriptions fix the same reference, for which they obviously need not be the same. That way, Macia's proposal avoids a major difficulty associated with the classical descriptivist view, which is the implausibility of assuming that there is a unique description for each proper name that is universally known by all speakers of a language.

The drawback of reducing the semantic role of descriptions, however, is that his view no longer answers the question how one can account for successful communication given that sameness of reference by itself is not sufficient. What, if not a difference in associated description, will explain the relevant difference between co-referential names such as "Hesperus" and "Phosphorus"? In other words, what explains why a hearer counts as having properly understood a speaker talking about Phosphorus only if he understands "Phosphorus" and not "Hesperus"? Evidently, this question is crucial for Macia. On his proposal, it is possible for one Ancient Greek speaker to associate the description "celestial body visible in the morning" with the name "Phosphorus" and

[54] Macia actually does not mention Frege's Puzzle, but he discusses examples that are variants of it to disprove Kripke's arguments against the Fregean idea that descriptive senses account for semantically guaranteed sameness of reference. It clearly speaks to the significance of the Puzzle that it no longer has to be mentioned explicitly, not even in papers that deal specifically with the issues it raises.

[55] Macia starts with the notion of description but then switches to a more general notion of idea. These ideas can contain descriptive information, but also other things, such as non-verbalizable information like visual cues (2004: 135). Macia's ideas are arguably very similar to modes of presentation as some theorists understand them. As the distinctions between the three notions are irrelevant for current purposes, the notion of description is maintained.

for another to associate "celestial body visible in the evening" with it, and they can nonetheless communicate successfully about Venus by using the name "Phosphorus". The reason is that Macia does not require descriptions to be correct, they only have to fix the same reference, which they do in this case, even though neither speaker would know that. The same is not true, however, if the name "Hesperus" is used, even if it has the same description associated with it as "Phosphorus". So how can one account for the fact that some instances of communication are successful, despite a difference in associated description, while others are not, despite the fact that the names have the same associated description?

To answer this question, Macia appeals to coordination. Some uses of co-referential names are coordinated, while others are not, and it is required for successful communication that proper names are coordinated in addition to being co-referential (2004: 139). The example above makes it clear that coordination is in fact necessary in addition to descriptions, as the latter cannot account for the former. Sameness of associated description is neither necessary nor sufficient for coordination. Coordination is therefore established independently by what Macia calls a coordination requirement on proper names (2004: 140). So while descriptions fix the reference of proper names for individual users, they are irrelevant with respect to the coordinated use of proper names that underlies successful communication.

How does this compare to Semantic Relationism? The first analogy pertains to the irreducibly relational nature of coordination. In Macia's approach, there is an irreducible relational aspect to coordination in that no intrinsic feature of a proper name, such as an associated description or its reference, accounts for the coordination between a name as used by a speaker and by a hearer in a successful conversation. For Macia, coordination is a relational aspect of proper names over and above the descriptions associated with them, and the Relationist evidently agrees on the irreducibly relational nature of coordination. There is also a substantial dissimilarity in this regard, however. Given that coordination is required according to Macia precisely because descriptions are no longer part of the content of proper names, one would expect coordination to be part of the content instead. Interestingly enough, though, that is not Macia's view. He concludes from the fact that description are not part of the content that proper names have only reference as semantic content (2004: 135). So even with both descriptions and coordination, Macia adopts a Referentialist semantics. This entails that on his account, sameness of content is also no longer sufficient to account for successful communication, as sameness of content only amounts to sameness of reference. Accordingly, Macia rejects the link between content and successful communication. Semantic Relationism differs in this respect. By considering coordination part of the content of proper names, it maintains the idea that successful communication is based on the identity of semantic content.

So which view is more plausible? As mentioned in the previous section, Taschek argues that the fact that co-referential expressions have different logical properties is a compelling reason to think that they differ in content. So if Taschek is correct in this regard, Macia runs into trouble. Another way to assess the relative plausibility of both proposals is to focus on the role of the semantic content of a sentence as that what is communicated when a sentence is used. Considering monadic cases of the Puzzle, there is clearly a certain plausibility to Macia's point that "the sole semantic function of the name is to provide some individual" (2004: 135). One can imagine, for example, a case in which a speaker says that Phosphorus is a planet. It is then plausible to assume that all the speaker intends to communicate is that there is an object (Phosphorus/Venus) that has a certain property

(being a planet). So in saying that Phosphorus is a planet, a speaker can realize the intention of teaching a hearer that it is a mistake to think of Phosphorus as a star, as the Ancient Greeks did. Moreover, if the speaker knows that Phosphorus is identical to Hesperus, and knows that the hearer to know this too, it is arguable possible for him or her to realize exactly the same intention by saying that Hesperus is a planet. Whatever option is chosen, what is communicated is exactly the same. This intuition is captured theoretically by saying that both monadic sentences have the same semantic content, which might be taken to suggest that the semantic content of proper names is only its reference. This in turn supports a Referentialist semantics, which Macia endorses, and speaks against a Fregean semantics according to which both monadic sentences differ semantically because the proper names express different senses. The point does not speak against a two-tier semantic theory as such, however, as Semantic Relationism is also able to respect the underlying intuition. Unlike a Fregean, the Relationist can accept that both sentences have exactly the same content if considered individually. The reason is that they do not differ in intrinsic content. Hence, the intuition that both monadic sentences have the same semantic content is due entirely to the fact that the co-referential proper names differ only in extrinsic content, which difference is not pertinent in the example that grounds the intuition. That way, the Semantic Relationist is able to accommodate the intuition that in such cases the communicative intentions with proper names are restricted to providing objects. As a result, both proposals are on a par in view of monadic cases.

Macia's proposal is much less plausible for dyadic cases, however. As an example, one can consider an assertion to the effect that Phosphorus is Phosphorus made with the intention of exemplifying the logical law of identity. In that case, it evidently makes a difference if the assertion that Phosphorus is Hesperus is made instead. Which proper name is used as the second name matters once the first has been chosen, even if both names are in fact co-referential and both speaker and hearer know this. The reason is that the speaker not only intends to communicate the identity of some object with itself, but intends to do so in a way that makes the identity self-evident, as an instance of the law of identity. It is thus plausible to assume that the self-evidence of the identity is part of what the speaker intends to communicate. After all, his intention is to exemplify the law of identity. If that is correct, however, one has to assume that the fact that both proper names obviously refer to the same object is part of what the speaker wants to communicate. Hence, what the speaker intends to communicate with both names is not just the object the names are about, but also how they relate to each other, in the sense that he intends to communicate that they are obviously names of the same object. It follows that in such cases, the semantic function of proper names goes beyond merely providing an object, contrary to what Macia states[56].

Another way to make this point is as follows. While in the monadic case, the speaker may freely choose between either of the co-referential alternatives, this is no longer true in the dyadic case. Evidently, the speaker could have used the alternative "Hesperus is Hesperus" to realize the same intention, but that only shows that "Phosphorus is Phosphorus" and "Hesperus is Hesperus" do not differ in semantic content, not that "Phosphorus is Phosphorus" and "Phosphorus is Hesperus" do not[57]. Given the connection between the semantic theory and the communicative function of proper names, this fact has to be captured by saying that the obvious and the non-obvious identity

[56] The fact that in Semantic Relationism the relevance of which proper name is used emerges only in relation to other occurrences of proper names accounts for the Relationist aspect, while the import of this for what is communicated accounts for the semantic aspect.

[57] This is again captured in a Relationist semantics by the fact that both obvious identities have the same intrinsic content, and differ only in extrinsic content, just like the individual names "Phosphorus" and "Hesperus".

have different semantic content. The Relationist can accommodate this by virtue of the fact that there is a difference in how the proper names in the identity statement are semantically coordinated, which marks a difference in the intrinsic semantic content of the identity statements. In the obvious identity statement, the proper names are coordinated, while in the non-obvious identity statement, they are not[58]. So in the dyadic case, the sentences differ in content for the Relationist even if they are considered individually. For a Referentialist such as Macia, in contrast, there is no difference in semantic content between the obvious identity statement and its non-obvious counterpart. This leaves the Referentialist with two options. The Referentialist can either maintain that what a speaker intends to communicate is the same in both cases, which is rather implausible, or give up the link between semantic content and what is communicated by means of language given the intentions of the speakers. In that case, only the Relationist can uphold the claim that semantic content explicates what is linguistically communicated. So if one thinks that the ultimate goal of a semantic theory is to explain linguistic communication, Semantic Relationism is preferable.

A further consequence of Macia's exclusion of coordination from the semantics is that he has to give up the transparency of content. It is intuitive to assume that in a certain sense, people generally know what they believe. In other words, the content of their beliefs is transparent to them, at least for those beliefs that they are able to communicate linguistically. This is not the case on a Referentialist semantics, however. To see this, one can consider the example of an ancient Greek who holds the belief that Phosphorus is a star and the belief that Hesperus is a star. The ancient Greek will certainly think of these two beliefs as differing in content, yet according to a Referentialist such as Macia, they do not. In that sense, the content of the beliefs is not transparent to the believer. Both beliefs do in fact have the same content, but the believer does not know this. In fact, the Ancient Greek cannot know this, unless he or she finds out that the celestial body visible in the morning is identical with the celestial body visible in the evening. On the Referentialist semantics endorsed by Macia, it follows that people do not really know what they believe. It also follows that they do not really know what they say when they say what they believe.

These results are clearly undesirable. Even worse is the fact that a Referentialist must accept that the Ancient Greek knows exactly what the content of the individual beliefs is. The believer knows that Phosphorus refers to Venus as it is visible in the morning, and that Hesperus refers to Venus as it is visible in the evening, both of which are true. Since content is only reference for a Referentialist, it follows that the believer fully knows the content of both beliefs, and still fails to know that both contents are the same. On this description of the facts, the believer looks rather irrational, which is not the case by any reasonable measure. In addition, a Referentialist cannot avoid this difficulty by claiming that it is implausible to assume that a subject is always fully aware of all his beliefs. While true, it is irrelevant. The transparency of content does not fail here for subconscious beliefs, or beliefs with a highly complex content, but for two very simple beliefs of which the subject has full awareness. Figuratively speaking, transparency does not fail at the periphery, but right in the middle. Moreover, the root problem is not that the believer happens not to realize the relevant identity of content, but that it is in principle impossible for him or her to do so on the basis of introspection alone.

[58] This is not to suggest, by any means, that using phonological identical names is sufficient for coordination. What a speaker ultimately says depends on his intentions, that is, whether he intends to communicate for instance the obvious truth that Aristotle (the philosopher) is Aristotle (the philosopher) or the ludicrous view that Aristotle (the philosopher) is Aristotle (the shipping magnate). The intention is in turn fixed by the content of the belief that provides the content the speaker wants to get across and that is causally responsible for the intention to communicate.

On the Relationist proposal, this unpalatable conclusion is avoided. For the Relationist, both beliefs have the same intrinsic content, but they differ in extrinsic content. While the believer is thus certainly mistaken in thinking that both proper names, and hence both beliefs, differ in intrinsic content, he or she is correct in assuming that the proper names differ in content relative to each other, as there is no coordination between the proper names they contain. This relative difference in content between names is perfectly transparent to the believer, and it explains why it is reasonable for him or her to suppose that both beliefs differ in intrinsic content even if they do not. And the mistake the believer commits regarding the intrinsic content of the proper names only amounts to the innocuous failure to realize that both proper names are co-referential, which is of course why the believer also fails to realize that both beliefs have the same intrinsic content. The Relationist can thus point to a difference in content in line with the self-perception of the believer, and thus uphold the transparency of content[59].

The second problem with Macia's account is apparent if one looks at the details of his proposal. Macia elaborates his theory by means of the following example (2004: 137)[60]. There is an isolated island with two linguistic communities that speak the same language but do not communicate with each other because there is an insurmountable mountain between them[61]. Certain objects, such as planes, are visible to both communities on a regular basis, though. By sheer coincidence, one such object, the only yellow plane, say, is given the same name by both communities, "Cratacrota"[62]. All the other planes have different names in the respective communities, as one would expect by the laws of probability. Then, on one memorable day, one speaker of each community manages to reach the top of the mountain at the same time, so that for the first time in living memory two people of the different communities meet. On that occasion, one mountaineer tells his counterpart: "Cratacrota did not fly this morning", upon which the hearer forms the corresponding belief that the yellow plane referred to by that name in his or her community did not fly that morning. The simple question Macia then asks is whether the hearer correctly understood what the speaker said. Was it a case of successful communication?

Macia thinks the answer is no. He maintains that there is no real understanding since there is an accidental element to it. The hearer ends up with the "same" belief as the speaker, as if he understands him correctly, but only by pure chance. It is only by coincidence that what the hearer understands is identical to what the speaker intends to communicate. To show that this is the correct assessment, Macia appeals to an argument about knowledge. If communication is

[59] Fine's full solution to this problem is similar, if much more detailed (Fine 2009: 60). Distinguishing between semantic facts and semantic requirements, Fine understands coordination as semantically required co-reference, which holds if knowledge that two expressions co-refer is part of the semantic knowledge required for the competence in a language. Semantic knowledge is in fact knowledge of a body of semantic requirements. The point then is that for semantic requirements, there is no principle of closure, unlike for semantic facts. If it is a semantic fact that Phosphorus refers to Phosphorus and that Hesperus refers to Hesperus, then it is also a semantic fact that Phosphorus and Hesperus are co-referential (given that Phosphorus is Hesperus). In contrast, if a person is semantically required to know that Phosphorus refers to Phosphorus and that Hesperus refers to Hesperus, it does not follow that he is semantically required to know that both proper names are co-referential. Accordingly, a semantically fully competent speaker can know what two co-referential expressions refer to without knowing that they are co-referential. That is of course the situation the believer described here is in. As a result, transparency does not require knowledge of co-reference for expressions that are not coordinated, that is, expressions that differ in extrinsic content. This admittedly requires that differences in extrinsic content are transparent, which is plausible on the current proposal though, on which intrasubjective coordination is grounded in syntactic identity.

[60] The example is altered slightly, and only in ways that are insubstantial to the points made.

[61] To make this plausible, one can imagine that both communities speak the same language as they used to have either mountaineering or seafaring skills that are no longer available.

[62] This means that the name was introduced after the linguistic separation.

successful, Macia claims, the hearer should count as knowing by testimony that Cratacrota did not fly that morning[63]. The underlying idea is plausible. It is generally accepted that people can know things by learning them from others through linguistic communication. In fact, most of what people know is learned by that method. However, in the case described, it is intuitive to assume that the hearer has not gained knowledge about Cratacrota. Even though what the hearer believes is true, it fails to be sufficiently justified to count as knowledge. It is in fact a classical case of a belief that is true but believed for the wrong reasons. So while is generally possible for a person to know something upon being told by someone else, it is plausible to maintain that in the case described there is no knowledge.

The important question is why. What justification is missing? The problem is clearly not that the speaker is untrustworthy, or that he or she has no knowledge about Cratacrota to begin with. The obvious answer is that the linguistic interaction does constitute sufficient justification for the hearer's belief that Cratacrota did not fly that morning. The reason is evidently that the hearer has no justification for the assumption that the speaker uses the proper name to speak about the same object as he or she does[64]. Importantly, this is not changed by the fact that both the proper name and the resulting belief are in fact understood exactly as intended by the speaker, as the hearer got it right only by chance. In other words, the element of chance explains the plausible intuition that the hearer lacks knowledge. According to Macia, this is in turn explained by the fact that there was no successful communication between the speaker and the hearer to support knowledge by testimony, given that the proper names used by the speaker and the hearer are distinct even if factually co-referential[65]. Therefore, Macia asks:

> "What went wrong? I would like to suggest that what was missing in this case is that [the speaker] and [the hearer] were not coordinated in their use of [the proper name]" (Macià 2004: 139)

The main point is that for successful communication, it is not enough that two people use a homophonic and co-referential name, not even if they associate the same description with it. Even if both speaker and hearer associate the description "the unique yellow plane" with the name "Cratacrota", the linguistic interaction still does not count as successful, as shown by the fact that it does not alter the intuition about the lack of knowledge. Something more is required, which Macia claims is that both names have to be coordinated.

Macia subsequently offers a two-stage definition of coordination, starting with a definition of immediate coordination (2004: 139-140). Two names are immediately coordinated if (2004: 141-142):

(42) A learns name N from B, or

[63] One can assume that the speaker knows this, viz. that it is true, believed by the speaker and justified in the right way. A further assumption is that the hearer did not know it before the conversation took place.

[64] To be clear, the assumption is not that a hearer always needs a positive reason for the assumption that a proper name is used in the same way. That requirement would be too strong, and probably exclude many cases one would intuitively consider knowledge. Rather, a weaker principle holds according to which there has be the absence of a negative reason to assume that a proper name is not used in the same way. In the case described, there is such a reason, however. Since the speaker is known to belong to a separate linguistic community, and there is no linguistic interaction between the communities, the hearer has good reasons to suppose that the proper names used by the speaker are different from his or hers.

[65] This leaves it open whether Macia thinks that the ability to support knowledge is criterial for successful communication or whether it is merely considered a universally reliable test. Nothing hinges on that difference, however.

(43) B learns name N from A, or

(44) A and B both participate in the introduction of name N.

This captures the basic idea of coordination. Names have to be related in a substantial way in order to avoid homophony that is purely coincidental. The definition also shows why communication is not successful in the Cratacrota case. As the proper names for the yellow plane as used by the speaker and the hearer are completely unrelated, the communication fails Macia's coordination requirement. This can in turn be used to explain the lack of knowledge. Given that there is no coordinated use of a proper name, there is no justification for assuming co-reference, and thus no justification for the belief formed by the hearer.

Immediate coordination is somewhat limited in scope, however, as it requires two people to directly derive a proper name from each other, unless they participate in the initial baptism. For instance, it does not cover the case where A and B together learn a name from C, where one still would want to count future linguistic interactions between A and B as successful. A simple example shows this. One can imagine a case in which two philosophy students from two remote parts of the country meet at a seminar and converse about Plato. In that case, one clearly accepts that the students can successfully communicate about Plato even though they did not learn the name from each other, nor did they learn the name together, nor were they present at Plato's baptism, of course[66]. To cover such cases, Macia introduces coordination simpliciter, which holds if (2004: 141):

(45) N as used by A is immediately coordinated with N as used by B or if it is coordinated with N as used by someone whose use is immediately coordinated with B's.

Crucially, the definition contains coordination rather than immediate coordination in the second part. This makes the definition recursive, which allows for a reiterated application, so that as many people as necessary can be interposed. As a result, the general definition covers the case with the two students, as there is presumably a chain of immediate coordination relations running from A to B, in the worst case via the person who baptized Plato (but presumably much shorter), because of which A's use counts as coordinated with B's. Therefore, the name "Plato" as used by both students is non-accidentally co-referential, which accounts for the fact that they can successfully communicate by means of that name and so explains why one student can gain knowledge about Plato from the other by testimony.

The importance of coordination is clearly a key idea of Semantic Relationism as well. There is a crucial difference, however. Perhaps the most distinctive feature of Semantic Relationism is that it allows for the coordination relation to be non-transitive. This point was already made with respect to Sainsbury's sameness of sense relation, which is necessarily transitive. The same is true for Macia's coordination as well. If A's use of a name N is coordinated with B's use, and B's use is coordinated with C's use, it follows from the definition that, via B, A's use must be coordinated with C's use. Hence, even if the everyday notion of coordination is not necessarily transitive, in the technical sense defined by Macia it is. To be sure, immediate coordination is not transitive, but the necessary generalization of the definition renders the general notion of coordination transitive,

[66] The assumption is of course that both already knew the name when they entered university and that they did not meet before.

and the general notion is ultimately explanatory in Macia's account. Although this is clearly not a problem for the examples discussed by Macia, there are in fact cases due to Kripke and Fine for which the transitivity assumption has serious negative consequences[67]. In view of the fact that necessary transitivity is not built into the coordination relation in Semantic Relationism, these cases therefore show that Semantic Relationism is ultimately preferable[68].

In conclusion, although Macia posits a coordination relation that shares some of its properties with the key relation posited by Semantic Relationism, there are important differences in terms of how coordination is defined and understood. In these points, however, Macia's proposal can be shown to be problematic, which motivates a conception of coordination as proposed by Semantic Relationism.

Before discussing Heck in the next section, a final note on a valid point Macia makes. Macia points out that although his discussion is restricted to proper names, the problem of coordination arises more generally, for predicates, for instance. Fortunately though, not only the problem has wider scope, but so does the proposed solution (2004: 141-142). Hence, what is true about the coordination between co-referential names also holds for co-referential predicates[69]. The Semantic Relationist can adopt the same attitude as Macia in this respect. However, the current proposal does not follow Macia's claim that the point even holds for entire sentences (2004: 142). The reason is that the extension to entire sentences raises a serious problem given how Macia defines coordination. If entire sentences require coordination in order to be communicated successfully between people, this entails that they have be derived in their entirety from each other or need a common point of origin. To give an example, person A can then only count as having understood person B saying "Green elephants can fly" if the use of the entire sentence is connected in the way stipulated by the definition for coordination. This is implausible and unnecessary, as well as contrary the usual conception of linguistic competence on the basis of compositionality. The principle of compositionality allows that two people can derive the meaning of a complex expression such as a sentence independently, on the basis of their common knowledge of the meaning of the basic expressions and the syntactic rules. Hence, one should maintain that coordination between sentences holds, if at all, only in virtue of the coordination between their basic constituents and compositionality. Because of compositionality, it is sufficient to posit coordination between the basic constituents to account for the successful communication of sentences. It is neither plausible nor necessary to assume coordination holds between sentences in the way it holds between the basic expressions such as names and predicates[70].

[67] These cases are discussed later on.

[68] An interesting question is whether Macia could define his general notion of coordination without building transitivity into it. It is at least not obvious how. However, if it is possible, and one also accepts the semantic status of coordination for the reasons given above, it is clear that the resulting theory will be identical to Semantic Relationism in all relevant aspects.

[69] See Sullivan (2005) for a similar point. The assumption here, which is shared by Sullivan for much the same reasons, is that predicates refer to properties rather than sets of objects. As a result, being co-extensional is not enough for predicates to be co-referential, not even if the co-extensionality is necessary. On this view, a predicate refers to the same property in all possible worlds. What property a predicate refers to is purely a linguistic matter, independent of the possible world under consideration, while its extension is a worldly matter that depends on the objects a world contains and the properties they possess.

[70] The point that there is no need for coordination with complex expressions as relata because of compositionality is further discussed later on.

1.2.5 Heck's Formal Relations

This section considers a recent proto-Relationist proposal offered by Heck in a paper called "Solving Frege's Puzzle", which turns out to be overoptimistic (2011). Heck's basic idea is to solve the Puzzle by means of what he calls formal relations, which are, unlike the coordination relations posited in Semantic Relationism, not part of the semantic content of expressions. The fundamental problem with Heck's non-semantic account, which is in this crucial aspect similar to a proposal from Fodor discussed in greater detail later on, is that it fails for intersubjective variants of Frege's Puzzle[71].

Heck's paper has two main parts. In the first part, Heck presents a general discussion on the problem raised by Frege's Puzzle and criticizes some of the previous attempts to solve it, most notably pragmatic solutions. More specifically, Heck shows that it is not possible to uphold a Referentialist semantics by appealing to pragmatic factors in order to solve the Puzzle. Since the current proposal agrees with Heck in this regard, no in-depth discussion of this part is offered here. In the second part, Heck develops his own solution. The basic idea is to appeal to formal relations in addition to reference to mark the relevant difference between co-referential proper names. The problem with Heck's proposal, however, is that it fails for intersubjective variants of the Puzzle, as the formal relations are not adequately definable between the co-referential proper names as used by different speakers[72].

The section is structured as follows. First, Heck's outlook on Frege's Puzzle and his rejection of pragmatic solutions are presented, along with some general observations on the Puzzle. Heck's proposed solution is discussed next, and its limitations are highlighted. Finally, the section offers a useful comparison between Heck's proposal, Fine's approach and the modified version of Semantic Relationism adopted in this thesis.

1.2.5.1 Frege's Puzzle and Pragmatic Solutions

Heck starts off with the main question of his paper, which is the main issue in this thesis as well:

> "How must we understand the contents of mental states such as beliefs [...] if those states are to play the causal and explanatory roles envisaged for them?"
> (Heck 2011: 1)[73]

Heck then makes an observation that is crucial for the theory of belief:

[71] The intersubjective variants are a problem for Fodor as well. They are discussed as variants of Frege Cases for the Language of Thought later on, together with Fodor's proposal to address them. Roughly, the problem is that Fodor's syntactic solution to Frege's Puzzle fails to properly determine the type identity of co-referential Language of Thought symbols across thinkers.

[72] Using the terminology introduced earlier, the result is that Heck's proposal can only account for weak de dicto adequacy, in that it yields a criterion to determine identical structure (isomorphism) between two belief systems. It cannot, however, accommodate strong de dicto adequacy, which captures the idea of belief systems that are truly identical in content.

[73] The answer suggested in this thesis is that one has to assign semantic content to the constituents of belief as determined by Semantic Relationism, reference and coordination. This implies that beliefs have a syntactic structure and are composed of mental representations with syntactic properties, which amounts to endorsing the Language of Thought hypothesis, according to which beliefs are sentence-like entities in a mental language. Added to this basic picture is the thesis that natural language sentences have semantic content only derivatively, via the content of the mental representations with which they are associated. Specifically, the view is that natural language sentences, which ultimately are mental representations as well, have linguistic meaning rather than semantic content. Linguistic meaning consists in relations between natural language sentences and thoughts, which, as sentences in the Language of Thought, provide the semantic content intuitively associated with the natural language sentences themselves.

> "[T]he [...] important point is that we must not confuse questions about the nature of belief withquestions about the semantics of belief-attribution. Questions of the former sort lie, ultimately,within the province of cognitive psychology; questions of the latter sort lie within the province oftheoretical linguistics."
> (Heck 2011: 1)

In view of this important distinction, this thesis is concerned with Frege's Puzzle for beliefs. Hence, it is interested in the difference between, say, the belief that Hesperus is a star and the belief that Phosphorus is a star. In Heck's terminology, it thus aims to provide a theoretical contribution to cognitive psychology rather than linguistics[74]. The main motivation for Heck's distinction is that the by far most common Referentialist strategy with regard to Frege's Puzzle is to make us of pragmatic factors, which are factors about what sentences imply on given occasions of use. An example makes this clear. Proponents of a pragmatic approach claim that it is strictly speaking correct yet misleading to ascribe, say, the belief that Hesperus is visible in the morning to some Ancient Greek who believes that Phosphorus is visible in the morning. The ascription is correct in the sense that both sentences used in the respective ascriptions ("Hesperus is visible in the morning" and "Phosphorus is visible in the morning") have the same Referentialist content, and so ascribe the same belief content. Even so, the ascription is considered unsatisfactory as it falsely implies that the believer would assent to the sentence "Hesperus is visible in the morning". This is evidently not implied by the ascription that uses "Phosphorus" instead, which instead correctly implies that the believer would assent to (an appropriate translation of) the sentence "Phosphorus is visible in the morning". The basic strategy is thus to explain the apparent falsity of a co-referential but sense-distinct belief ascription by means of a difference in what they imply, which amounts to a pragmatic rather than a semantic difference between the belief ascriptions.

Evidently, the pragmatic account of belief attributions is far from uncontroversial. It is not obvious that the respective belief attributions differ only in what they imply rather than in what content they convey. The far more serious concern from a cognitivist perspective, however, is that the response fails to address the deeper question about how the beliefs attributed differ. To address that question, the pragmatic approach is clearly of no help. Whatever the pragmatic difference between co-referential belief attributions is, there is no corresponding pragmatic difference between the actual beliefs. The reason is that pragmatics is concerned with the effects that are due to the use of language in utterances and assertions, which has no application to beliefs. Beliefs are not used in conversation as natural language sentences are. Hence, a pragmatic difference as may exist between co-referential belief attributions cannot explain anything about the underlying beliefs, and so the pragmatic approach does not contribute towards answering the question how the co-referential beliefs in Frege scenarios differ.

Although the distinction between beliefs and their ascriptions seems hard to miss, Heck is arguably right to claim that it has often been overlooked in the literature:

> "In fact, it isn't always clear whether a particular author is discussing a thesis about belief or, instead, a thesis about belief-attribution. Some people do not distinguish the

[74] Although Heck's distinction is far from clear-cut, it can be accepted here insofar as linguistics is used as a label for the study of the meaning of natural languages. Since on the proposed view, the underlying mental representations are language-like as well, however, questions of a linguistic nature also arise within cognitive psychology, for instance regarding the compositionality of mental content.

> two theses at all, or they purposely run belief and belief-attribution together because they assume some strong connection between the two or, relatedly, between the contents of mental states and the contents of utterances, a conflation that is particularly common in the literature on belief from around 1980."
> (Heck 2011: 6, footnote 14)

He cites philosophers such as Block, McGinn and Loar as examples, and adds that he is "somewhat guilty [him]self" (Heck 2011: 6, footnote 14). The reason the two separate issues are easily confounded is presumably that they raise analogous problems. One can consider Frege's Puzzle insofar as it raises the question whether two co-referential belief attributions differ in content, but also insofar as it asks whether the attributed beliefs do. And if the proposed solution for belief attributions is that they differ only pragmatically, and not semantically, it is also very natural to assume that the beliefs do not differ in content either, if else one would have two distinct beliefs that differ in content paired with with two distinct ascriptions that do not. To begin with, this would prompt the question as to why the same difference in content should not obtain between the attributions as well. More importantly, it would raise a tricky question about which of the different contents of the beliefs the unique content of the attribution reflects. And if it is one of them, why not the other? Or if it is none of them, what content is it then, and how can the attribution be correct if its content is different from the content of either belief? These tricky questions explain why it only seems coherent to assume that if two co-referential attribution have the same semantic content, then the beliefs ascribed have the same semantic content as well. This explains why the pragmatic account very naturally leads to a view on which the actual beliefs have the same content, even though the account is primarily concerned with the semantics of belief ascriptions[75]. Although this thesis accepts the importance of the analogy between beliefs and their attributions as highlighted by the pragmatic approach to the Puzzle, it draws a diametrically opposed lesson from it. Given that the Puzzle is analogous for beliefs and ascriptions, and given that one cannot appeal to pragmatic factors to solve the Puzzle for belief, the lesson is that one should not propose to solve the Puzzle for ascriptions by purely pragmatic means either. In other words, as it is clear that the difference between co-referential beliefs is not pragmatic but semantic, one should accept that there is such a difference between belief ascriptions as well, which in turn entails the rejection of the view that the semantic content of proper names is only their reference.

Proponents of a pragmatic approach are well aware of some of the counter-intuitive consequences of their views. That is why they generally appeal to "propositional guises", which are ways for Russellian propositions to be presented to thinkers, to mitigate them (Heck 2011: 2). The basic idea is that co-referential beliefs are about the same proposition but under different guises, which explains for instance why a believer is not necessarily able to recognize that co-referential beliefs have identical content. As Heck explains, however, it is clear that in cases of co-referential proper names, the propositions in question differ in guise only because the object in the proposition differs in guise, where this object is the shared reference of the co-referential proper names that occur in the sentences that express the proposition. In Frege scenarios, it is thus objects that primarily appear to people in different guises, and propositions do so only in virtue of containing them. As a result of this, object-based guises look very similar to Fregean modes of presentation. Whether an approach

[75] Heck makes a similar point by appealing to slightly different considerations (2011: 7-8). The pragmatic account is of course compatible with the view that there is only a syntactic difference between co-referential beliefs, as claimed by Fodor and ultimately Heck as well.

that appeals to guises or modes of presentation is Fregean or not depends, however. If the guises are considered part of the semantic content of beliefs, then they are equivalent to Fregean senses and the result is a Fregean semantics for belief content. If not, the outcome is not a Fregean two-tier semantic theory. This then raises a question about the linguistic status of these guises, however. Since guises cannot be part of the pragmatics of belief, as beliefs have no pragmatic dimension, the only remaining option is to understand them as part of the syntax of beliefs, which means that a difference in propositional guise amounts to syntactic difference in the underlying vehicle of belief. As is well-known, this is Fodor's suggested approach to solving the Puzzle, which Heck in the end accepts as well. It follows that if proponents of a pragmatic approach to belief attributions aim to uphold a Referentialist semantics for belief, they have to accept that co-referential beliefs differ only syntactically. The main point is that there is no independent pragmatic approach to Frege's Puzzle for belief, as it has to be combined with either a semantic or a non-semantic solution to the Puzzle for belief. One of the main objectives in this thesis, however, is to show that a non-semantic solution to Frege's Puzzle for belief is ultimately not viable.

Before looking at the specifics of Heck's solution, a brief comment on a background assumption Heck makes that is accepted on the current proposal as well, namely a "broadly realist view of the mind" (Heck 2011: 2). Heck assumes that beliefs really exist, and are not just a fiction based on the everyday practice of ascribing them[76]. The background assumption ultimately relies on an empirical hypothesis about the nature of cognition as the foundation for linguistic competence and the human capacity for reasoning, as well as the outward behavior these are responsible for, in terms of both linguistic and non-linguistic behavior. Beliefs are posited for their explanatory role in this respect. For instance, one explains why a person behaves in a certain way by appealing to a specific desire and a set of pertinent background beliefs. The realist claim is that the desire and the beliefs are in fact causally responsible for the behavior, and not just useful instruments to make sense of people in a scientifically non-committal way. A thirsty person can serve as a concrete example. The person's desire to drink, together with the belief that water quenches thirst and that there is water in the fridge, are taken to provide a causal explanation of the behavior the person displays, for instance going to the fridge. The beliefs and desires are explanatory of behavior because they cause it. The realist view entails that such an explanation is strictly speaking correct or incorrect, and not just more or less useful to make sense of a person[77]. The overall cognitive-causal explanation in the example is evidently based on more than what is mentioned here. It involves a great many background beliefs about the physical world, for instance that fridges are not dangerous and do not attack when approached. This fact does not negatively affect the core explanation offered, however, which can be correct even if it is only partial.

The notion of semantic content plays a crucial role in such explanations. The explanation only makes sense because it is based on assumptions about what the pertinent beliefs are about. It would not be explanatory to point to a certain physical structure in the brain as causally involved in behavior if that structure could not be suitably connected to physical objects in the world. If a subject has a desire to drink water, and the resulting behavior of moving towards the fridge is explained on the basis of a belief that water is in the fridge, this evidently relies on the fact that the belief is actually about the fridge, if else the belief does not combine with the observed behavior

[76] Heck plausibly attributes such an "interpretationalist" view to Davidson and Dennett (2011: 2).

[77] This is not to say that it is always, or indeed ever, possible to find out the correct explanation. The claim is metaphysical, not epistemological.

in an explanatory way. In this manner, causal explanations make use of an appropriate theory of content as part of a broader psychological theory of behavior. The content of belief is required to allow beliefs to play the explanatory role assigned to them.

The role of content evidently explains why Frege's Puzzle is of fundamental importance for the theory of belief. As Heck points out, Frege cases suggest that certain instances of behavior are only explicable if different content is ascribed to beliefs even if they are about the same object, which is the case if the beliefs contain distinct yet co-referential constituents (2011: 3). In terms of semantic theory, the problem is that if the content of beliefs is considered Referentialist, then beliefs are individuated purely by the things they are about, which is too weak to support psychological explanation (Heck 2011: 3)[78].

Although this problem is considered in greater detail in the context of the Language of Thought hypothesis in the following chapters, the basic concern is that beliefs have to be individuated more finely to support the explanation of behavior by means of psychological laws. As an example, one can consider a fictitious Superman world in which it is a true law that people generally seek the company of strong superheros when in danger. The law stipulates that when danger approaches, people will move towards a location if they believe that Superman is there, but not if they believe that Clark Kent is there instead. The question is how this difference in behavior can be explained if the beliefs about Clark Kent and Superman are in fact taken to have the same content[79]. One option to defend a Referentialist semantics is simply to deny the truth of the law. Perhaps people do not generally approach superheroes to avoid danger. This option is manifestly inadequate, though, as it suggests that it is false to say that people in danger seek the company of superheroes for the reason that they do not approach people whom they do not even believe to be superheroes. So even if the putative law turns out to be false, the problem is that the response makes it false for the wrong reasons. That is why even a fictitious law in an imaginary world suffices to establish the basic problem for a Referentialist theory for the content of belief[80]. It is in fact not necessary for the law to be true or realistic. Real-life example are perhaps less conspicuous, but they do exist. One example are cases of famous people with pseudonyms, such as Heck's example of "Samuel Clemens", which is the little-known actual name of the well-known author Mark Twain (2011: 2). People who know the writer under his real name, say as a neighbor, and under his pen name but fail to know that their neighbor is the famous author, will display radically irrational behavior on a Referentialist theory of belief content. For instance, a person might have a very strong desire to get an autograph from Twain and believe that Twain is standing near by and yet fail to walk over to ask for one[81]. Such behavior is hardly irrational, however, if one takes into account that the person in question is in fact unaware that the neighbor standing close by is the sought-after author.

In view of this problem for Referentialism, Heck first discusses and rejects what he deems a desperate attempt by Fodor to address it, which consists in denying that such examples represent counter-

[78] Heck makes this point quoting Fodor, who has argued that psychological explanation creates difficulties for Fregean sense theories as well. These difficulties are considered later on, with a view to suggesting that they are due to features of the Fregean conception of a two-tier semantic theory that Semantic Relationism does not share. As mentioned already, it will be argued that Fodor's own solution to this problem is unsatisfactory as well.

[79] It is of course assumed that relevant desires and background beliefs are the same in both cases.

[80] Heck makes a similar point (2011: 4).

[81] The assumption here is that there are no overriding desires and beliefs, or other mitigating factors, such as extreme shyness. The point is that even without any of these, the subject would still not approach the writer.

examples to the laws in question (Fodor 2004). There is no need to elaborate on this type of solution, however, as Fodor himself has retracted it for being untenable. Heck then makes an important observation in preparation of his own solution. When behavior is considered, it is clear that co-referential beliefs must be considered distinct beliefs, but that does not entail that they must differ in content (2011: 4). While this observation is clearly correct, the crucial question is what lesson should be drawn from it. Heck ultimately concludes that it is possible to endorse a non-semantic solution to Frege's Puzzle. In stark contrast, this thesis is predicated on the view that it only shows that considering behavior is not sufficient to establish the necessity of a semantic solution, but that a fully adequate solution to the Puzzle must nonetheless posit a difference in content between co-referential beliefs. The main reason is that a satisfactory solution to the Puzzle has to work not only for the particular variant of the Puzzle under consideration, but should be applicable to all possible variants, given the fact that they all raise the same problem. In other words, the fundamental mistake Heck makes is to consider only a limited range of cases for which his solution works, and to falsely generalize from that. While Heck is correct that there is a non-semantic difference between co-referential but distinct beliefs, which is in turn sufficient to explain differences in how the beliefs are causally responsible for behavior, this does not mean that all variants of the Puzzle can be solved by positing only a non-semantic difference between co-referential beliefs. There are in fact cases where his proposal does not work, namely intersubjective cases, which are basically concerned with the conditions under which beliefs are identified across subjects[82]. A potential defense on behalf of Heck here is to point out that different cases may require different solutions. This defense is not very plausible, however, given how apparent it is that all variants of the Puzzle fundamentally raise the same problem. At the very least, a unified solution should be the default, which means that different variants of Frege's Puzzle should not be addressed by a multitude of partial solutions unless it can be shown that a unified solution is not feasible. The main claim in this thesis, however, is that a semantic solution, but only a semantic solution, has the promise to provide a unified solution to all variants of the Puzzle, and the fact that Semantic Relationism provides such a solution shows that a unified solution is possible, which seriously calls into question the alternative strategy of making different proposals in response to different variants of Frege's Puzzle.

1.2.5.2 Heck's Proposal

After briefly discussing and rejecting Braun's and Soames' attempts to solve the Puzzle, Heck offers his own proposal. The basic idea Heck retains from these previous attempts is that co-referential beliefs are different even if they are co-referential, which is why their co-reference may not be obvious to the believer. Heck aptly calls such beliefs compartmentalized (2011: 13). His quarrel with the previous proposals is that they do not adequately capture this compartmentalization such that it would explain how the believer reacts, both cognitively and in behavioral terms, to specific information. He adds that while cognitive and behavioral differences require that the beliefs are distinct, it does not follow that must differ in content (2011: 14). Heck's main line of reasoning is

[82] As explained, the issue is the adequacy criterion for strong de dicto belief attributions, a notion explained in the previous section. Speaking strictly about beliefs, the issue raised by the strong de dicto is to say when two people believe the same thing in the strongest sense. In that sense, it is not permissible to say that someone who believes that Superman can fly and someone who believes that Clark Kent can fly both believe the same thing. The question then is how these beliefs differ. They are co-referential, and the syntactic difference Heck ultimately posits to distinguish between beliefs within individual subject is of little help in this case.

roughly as follows. The fundamental challenge is to account for a difference in belief such that it can explain the behavior of a believer. With the computational approach to the mind endorsed by Heck, it is widely assumed that behavior is explained by the syntactic (and proximal) properties of representations, rather than by their semantic (and mostly distal) properties. The motivation is that the proximal and syntactic features of representations are accessible to the mind, and therefore available to computational processes. As these computations are causally responsible for behavior, it is reasonable to conclude that it is enough to posit a purely syntactic difference between co-referential beliefs. In fact, positing a semantic difference is pointless from this perspective, since as distal properties, they cannot contribute anything towards the primary explanatory target, which is to explain how co-referential yet distinct beliefs cause different behavior. Hence, given the stated explanatory aim, there are good reasons to posit differences in syntactic properties and not to posit differences is semantic properties between distinct but co-referential beliefs[83]. This reasoning is broadly analogous with Fodor's line of thought, who also concludes that since one has to accept that there are syntactic differences between co-referential beliefs, there is no reason to assume an additional semantic difference, as Fregeans for instance do. Occam in fact suggests that additional assumptions should be avoided if possible[84]. After making this point about the role of semantics, Heck adds:

> "If we are to be able to explain [a subject's] behavior in cognitive terms, there must be some difference between these [co-referential] beliefs that plays a role in psychological explanation. But no intrinsic difference between these beliefs plays that role. The explanatorily relevant difference is an extrinisic, relational one concerning how these beliefs are related to other of [the subject's] beliefs."
> (Heck 2011: 14)

The similarity with Fodor's approach, which is discussed in detail later on, apparently ends here. While both agree that no semantic solution is required, Fodor thinks the difference is syntactic, and so intrinsic, as the syntactic identity of a representation is a property intrinsic to it. Heck rejects this commitment to intrinsicalism. The motivation for his rejection is not immediately obvious, however. Fodor would certainly agree that the syntactic difference becomes relevant only in relation to other beliefs, but that does not mean that the difference itself is non-intrinsic. The relational nature of the relevance of the difference is indisputable, but that does not entail that the difference itself is relational as well. Moreover, it is not at all obvious what Heck's alternative proposal is. The main objection Heck appears to have against a view that only appeals to the syntactic properties of representational states such as beliefs, which he calls the representational view, is that it is not sufficient as a solution:

> "[...] I do not think that the representational view, on its own, yields a solution to Frege's puzzle [...]"
> (Heck 2011: 22)

The reason for his skepticism is his view that appealing to syntactic properties interferes with the fact that

[83] While the causal efficacy of syntactic properties is uncontroversial, there is an ongoing debate about the causal efficacy of semantic properties (Segal and Sober 1991, Segal 1997; 2009, Egan 1992; 1995; 2010, Ludwig 1994, Shagrir 2001, Piccinini 2006). Since the thesis accepts the causal inefficacy of content, which speaks in favor of Heck's reasoning, this discussion can be set aside here.

[84] Fodor considers this a strong point against Fregeanism, given how problematic Fregean senses are ontologically.

> "psychological laws subsume psychological states in virtue of the intentional properties of those states"
> (Heck 2011: 22-23)

The main point here is that appealing to syntactic properties is not sufficient to account for the correctness of psychological laws. Hence, Frege's Puzzle for belief needs a distinction in terms of what is represented semantically, which is a difference in content, and not just a difference in how that content is represented as a matter of vehicle. In order to see why this is correct, it is important to distinguish between what makes a law true and what makes a law applicable[85]. The basic point then is that while the syntactic features of a belief account for the truth of a law, the content of a belief accounts for its applicability. This is not the motivation behind Heck's conclusion, however, about which more in a moment. First, an example to show why Heck's point is correct.

An exemplary and presumably true psychological law states that Ancient Greeks who want to see Phosphorus go out for observation in the morning (rather than in the evening). This law, which predicts a certain behavior, is true (in part) because of the syntactic properties of the belief that Phosphorus is visible in the morning, and the causal responsibility these properties have for the behavior of the people that are subsumed under the law for having the belief. Hence, people with certain beliefs and desires about Phosphorus will display the behavior predicted by the law, and the fact that same syntactic symbol for Phosphorus is used in all the relevant beliefs and desires is part of what explains why this law is true. If the beliefs and desires would contain symbols that are respectively distinct, the behavior would not be caused, and the law would not be true. The problem in that case would be that the beliefs are not properly connected to the desires, so that the desires no longer provide the motivating force necessary to cause the behavior[86].

But these syntactic properties do not, and cannot, explain why certain syntactic objects, and hence their bearers, are subsumed by that very law. The syntactic properties of the representation for Phosphorus cannot account for the fact that a law that contains the expression "Phosphorus" is about that representation, but not a law containing the expressions "Hesperus". The applicability of a law to a specific set of representations can only be explained by the fact that these representation have a certain content, as provided by the expression "Phosphorus" but not "Hesperus". The main reason syntactic properties are of no help in terms of applicability is that within a cognitive system, syntactic identity is based on physical identity, which is to say that a cognitive system uses the same physical symbol throughout for the same mental representation[87]. It is highly unlikely, however, that different thinkers use the same physical symbol for the same mental representation. The reason is that it is in fact arbitrary what specific symbol a system uses for a given mental representation, all that matters is that the same symbol is used throughout. This arbitrariness, together with the law of probability, suggest that two distinct cognitive systems will not generally use the same mental symbol for a given mental representation. So while one cognitive system will use a unique symbol for the representation of Phosphorus, it is very unlikely that another system will use that very same symbol for its representation of Phosphorus. Therefore, one has

[85] As is customary in the literature, the notion of a psychological law is used here in a weak sense in which it is equivalent with a psychological generalizations.

[86] This takes for granted a computational approach to the mind and assumes evidently that nothing else makes the law true, viz. that the law is not overdetermined by the empirical facts.

[87] The physical shape can be abstractly represented by a series of 1's and 0's. Two symbol tokens are physically and thus syntactically identical if they are representable by the same series of 1's and 0's.

to appeal to the content of these mental representations, rather than their syntactic properties, to explain why a certain law about Phosphorus applies to some mental representation, namely those about Venus as Phosphorus, but not others, namely those about Venus as Hesperus. This in turn explains why some representations but not others speak to the truth of laws involving Phosphorus. In addition, this also means that a notion of content is needed that takes into account the difference between the mental representations for Phosphorus and the mental representations for Hesperus. The problem for Referentialists such as Fodor and Heck is that their Referentialist notion of content is not up to this task, given that both mental representations are co-referential, and hence identical in referential content.

Hence, while Heck is right to claim that

> "[w]e do, indeed, have to allow that psychological explanation needs to make reference to features of mental states beyond their content"
> (Heck 2011: 15)

it is a mistake to conclude that doing so is by itself enough to solve Frege's Puzzle for belief. Syntactic features are a necessary but not a sufficient aspect of a satisfactory solution, and so they cannot be used to defend a Referentialist semantics. Syntactic properties can explain the truth of a psychological law in specific cases, but they cannot explain why some cases, but not others, are actually cases about which a given law speaks. And without the ability to properly determine the cases relevant for each law, it is not possible either to explain why some empirical facts but not others speak to the truth of a law.

As pointed out, Heck apparently accepts the limits of a purely syntactic solution to the Puzzle. Unlike the Fregean or the Semantic Relationist, he still maintains that there is no need for a two-tier semantic theory. Instead of a second element of content, such as Fregean senses, Heck claims one requires formal relations:

> "The proposal I am making abandons this aspect of Frege's view. It implies that the correctness of an inference - a rational transition from one mental state to another - cannot be stated purely in terms of facts about the contents of the states involved. The formal relations that hold between mental states must also be specified, and the fact that certain beliefs do or do not stand in such formal relations does not supervene on those beliefs' contents. That, I am claiming, is what Frege cases show us."
> (Heck 2011: 26)

Heck clearly rejects a semantic solution here, but it is not entirely obvious what his alternative proposal is. Evidently, the formal relation invoked is independent of the content of the expressions involved, but it can also not be a matter of syntax alone, given that Heck is unwilling to accept a purely a syntactic solution. Moreover, his proposal is supposed to be more general than Fodor's syntactic approach (Heck 2011: 23). However, on the other hand he also speaks of "formal (that is, syntactic) properties", which suggests that "formal" and "syntactic" are co-extensive, as is commonly assumed (Heck 2011: 42). Heck seems to vacillate between a syntactic solution to Frege's Puzzle and something that is slightly different. Arguably, Heck's indetermination is at least partly due to a misunderstanding of Fodor's syntactic proposal, about which more momentarily. Heck decisively rejects the Fregean view, but he also seems to realize that an appeal to syntax, while important, is by itself not enough to fully solve Frege's Puzzle, an insight that is confirmed

by the intersubjective variants of the Puzzle discussed later in the thesis. In this respect, Semantic Relationism is clearly preferable. The solution the Relationist offers is clear in what it proposes, which is semantic and so sufficiently general, but it also allows for syntax to play an important role. The proposal does not appeal to syntactic considerations alone, but it assigns an important role to syntax by virtue of grounding intrasubjective coordination on syntactic identity. This point is discussed extensively when the application of Semantic Relationism to solve Frege's Puzzle for the Language of Thought is considered.

In what regard is Heck mistaken about Fodor's proposal that co-referential beliefs differ purely in their syntactic properties? As explained, there is an important distinction between what makes a psychological law true and what makes it applicable. Heck claims that his approach is preferable to the syntactic approach endorsed by Fodor in terms of explaining the truth of psychological laws:

> "[T]he proposal I am making implies that psychological explanations and laws cannot be stated purely in terms of facts about the contents of mental states, either. But, to emphasize, the alternative I am offering is not that we should also make reference to particular Mentalese sentences - that would be fatal [...]"
> (Heck 2011: 26-27)

Heck is mistaken about the preferability of his proposal over Fodor's in terms of explaining the truth of psychological laws, however, as he is wrong about what Fodor actually suggests. To address the Puzzle, Fodor appeals to the relation of syntactic symbol identity, but not to the idea that there is an identical symbol corresponding to each mode of presentation across a linguistic community. Fodor can thus accept that different symbols are used for a representation in different individuals, as he only needs the claim that the symbol is always the same within each individual. So for each individual, the same symbol has to be used in all the explanatorily relevant desires and background beliefs, but this does not mean that the very same symbol has to be used in other individuals as well. Just like Heck, Fodor can thus fully account for reasoning and the causation of behavior that underlies the truth of psychological laws, and so there is no advantage for Heck in this respect[88].

Secondly, Heck is also mistaken in thinking that his view addresses the second issue about the applicability of psychological laws better that Fodor's. In this case, the reason is that his approach falls short just as much as Fodor's does. The reason Fodor cannot answer the question why laws containing, say, "Phosphorus" are about some mental representation about Venus but not others, is that the best he can do is to maintain that all thinkers subsumed under the law use the very same mental symbol for a given representation. This is possibly why Heck thinks that the appeal to specific Language of Thought sentences is fatal. Since it is highly implausible to assume that different thinkers use the same symbol for a given mental representation, Fodor's proposal falls short of providing a satisfactory solution to the intersubjective variant of Frege's Puzzle. The crucial point here, however, is that the same is true for Heck as well. He only has his formal relations to distinguish co-referential belief constituents, it is not at all clear how they can be used to explain why some mental representations for Venus are subsumed in laws about Phosphorus but others are

[88] Perhaps Heck can claim that his solution is still preferable by being more general, as it is not as strongly committed to the Language of Thought hypothesis as Fodor. Heck in fact sates that he thinks that the Language of Thought hypothesis is presumably true, but that his solution does not depend on it (2011: 27). On the downside, his proposal is therefore less specific. Moreover, Heck provides no reason at all to believe that his formal solution still works if it turns out that the Language of Thought hypothesis is incorrect, for instance if (non-implementational) connectionism is true instead.

not. It is rather unclear how they could explain what important features are shared by all Hesperus representations that are not shared between Hesperus and Phosphorus representations, even if they all share their content according to Heck. In fact, the way Heck explains his formal relations, it seems plausible to assume that it is of limited use in this respect, in much the same way Fodor's relation of syntactic identity is:

> "The term 'formally related' is a term of art. What it is supposed to mean is familiar from formal logic: Saying that Fred's belief that Clemens has died is 'formally related' to his belief that Clemens is his neighbor means that the beliefs have the feature we aim to capture in formal logic when we represent them this way: D(c), c = the N; rather than this way: D(t), c = the N."
> (Heck 2011: 24)

and

> "[i]t may well be that two beliefs standing in such a [formal] relation is, as a matter of fact, ultimately to be explained in terms of facts about how cognitive states are implemented."
> (Heck 2011: 26)

In the first quote, Heck draws on formal logic to explicate his formal relation. However, the suggestion is tantamount to saying that the formal relation holds in virtue of syntactic symbol identity, because that is how the relevant identity is captured in a formal logical language, namely by the use of the same symbol ("c") for Clemens twice, rather than two different symbols once ("c" and "t"). This reading is further supported by the second quote, which stresses the actual cognitive implementation for explicating the formal relation. This again appeals to the vehicles of representation, and Heck does nothing to even suggest that the underlying idea is anything other than the idea that a formal relation holds in virtue of the identity of the underlying symbol, which is of course exactly Fodor's proposed solution to Frege's Puzzle. Hence, Heck's proposal, although ostensibly proto-Relationist, is very similar to Fodor's view in the most important respect.

As a result, formal relations as defined by Heck are of no help in understanding the necessary connection between sense-identical symbols across different thinkers. Heck evidently has the option to claim that formal relations are to be understood differently in intersubjective cases. However, nothing Heck says even remotely suggests how the relation should be understood in those cases, and whether so understood it would be explanatorily adequate. It is therefore reasonable to be highly skeptical regarding the advantage Heck claims to have over Fodor's proposal. On the best understanding of what Heck's formal relations are, they are equivalent to the identity relation between syntactic symbols. Heck's approach is thus not better than Fodor's. And if that is not in fact Heck's view, then it is rather unclear what his view really his, which is why it can hardly qualify as better than Fodor's proposal either. The most plausible analysis, however, is that Heck fails to realize how similar his proposal is to Fodor's. That being the case, though, they share a crucial disadvantage. Although the syntactic or formal approach is necessary to explain the truth of psychological laws, it is not sufficient to account for their applicability. Like Fodor, Heck overlooks the intersubjective dimension of Frege's Puzzle, and thus proposes a theory that fails to properly take it into account.

To recapitulate, the main problem with Heck's account is that he appeals to a non-semantic solution, which is actually independent of relational aspect of his idea. The fundamental idea is that the difference highlighted by Frege's Puzzle need not be a difference in content:

> "[...] different beliefs [...] must have different contents, whence the contents must be individuated more finely than Russellian propositions are. This move is an extremely natural one, often tacitly made. What lies behind it, it seems to me, is the thought that beliefs just are relations between thinkers and contents"
> (Heck 2011: 14)

The basic point Heck makes is that differences between beliefs must not necessarily be differences in content, as there is also a vehicular aspect to beliefs. Beliefs have semantic content, but there is also a vehicle associated with a belief. While correct, Heck also suggests that the idea that there is a difference in content is often made rather casually and implicitly, without much motivation for it. That is not true, however. For instance, some philosophers think that the difference must be semantic as it is a difference in what the beliefs represent, which is captured by a difference in content. Others hold this view because there are different logical properties associated with sense-distinct co-referential expressions. Yet others appeal to the principle of transparency of content, which, together with the opacity of syntax, implies that if people are consciously aware of differences between their beliefs, they have to be differences in content rather than vehicle.

The notion of content is of course to some extent a technical notion, so the fact that a view has some counter-intuitive results is not a knock-down argument against it. However, the idea that content is the transparent and logically relevant notion that explains what a belief represents is not just a pre-theoretic common-sense concept, it also plays a theoretical role at the basis of various assumptions in psychology and cognitive science. Hence, the notion of content has a clear explanatory role. The question is therefore how the notion of content has to be understood so that it can fulfill its explanatory role. Heck's view is that a Referentialist understanding of content is acceptable as can explain everything that needs to be explained about Frege's Puzzle in terms of reasoning and the causation of behavior by appealing purely to the syntactic or formal properties of beliefs. As explained, however, this is a mistake, ultimately based on a confusion between questions about the truth and the applicability of psychological laws.

Hence, Heck's considerations show at best that there is a syntactic difference between co-referential beliefs, but not that there is not a semantic difference as well. If the focus is then purely on intrasubjective cases and the truth of the laws that establish the causal effect of mental representations on behavior, then Occam's razor suggests there is no need for a richer semantic theory, which motivates Heck's conclusion that one can maintain a Referentialist theory of content[89]. The fundamental problem with this conclusion, however, is the intersubjective dimension of the Puzzle, as highlighted by questions about to the range of application of psychological laws. And while it is arguably true that the empirical sciences focus their attention mostly on establishing the truth of the psychological laws they posit, this does not change the fact that they implicitly rely on a

[89] It is interesting to note that Heck argues against Fregeans that the difference highlighted by the Puzzle for beliefs cannot be purely semantic, which is to say that it cannot be a difference in sense alone (2011: 15-17). While correct, Heck is wrong to think that a Fregean, and for that matter a Semantic Relationist, is committed to such a view. The plausible alternative, which both the Relationist and the Fregean can endorse, is that there is both a syntactic and a semantic difference. For whatever reason, Heck seems to think, mistakenly, that the choice is only between purely syntactic and purely semantic solution to the Puzzle.

notion of content that has the role of determining their range of application.

1.2.5.3 A Comparison

Heck developed his proposal after the publication of Fine's Semantic Relationism, and so he is able to offer the following helpful comparison between his and Fine's view:

> "In this respect, Fine's 'semantic relationism' (2007) seems closer to Frege's view. Fine seems to agree with Frege that the correctness of an inference ought to be determined by a relation between the contents involved. If contents are Russellian, however, then the relation in question cannot supervene on intrinsic properties of the contents, so there must be some extrinsic relation involved, as well. On my view, by contrast, the correctness of an inference is not determined by any relation between their contents but by a relation between representations. But, obviously, Fine and I are in many ways thinking along the same lines, and, technically speaking, the two frameworks are likely to be intertranslatable. Nonetheless, the significance of the disagreement between us should not be underestimated. It goes very deep indeed. As I see it, the issue between me and Fine is whether the notion of a content, or proposition, is intelligible absent some notion of a representation: something that also has non-semantic properties, such as a sentence or a mental state. If it is, then the fundamental notion of validity should presumably be characterized directly in terms of propositions, and the approach taken here will seem to appeal to something inessential, namely, representations. My view is as it is because I do regard representations as essential to representation."
> (Heck 2011: 43)

Heck is right that Fine understands coordination as a semantic relation between contents, but it is important to realize that that idea is not essential to a Relationist semantics (Fine 2009: 54). The version of Semantic Relationism endorsed in this thesis is rather a middle way between the two options Heck offers here. To make this clear, one can note that the relevant relation can be characterized along two dimensions: its status and its relata. What Heck proposes with his formal relation is a relation that is non-semantic in status and has representations, or more generally, vehicles of content, as relata. Fine, in contrast, proposes a coordination relation that is semantic in status and has contents as relata. Accordingly, it differs from Heck's formal relation along both dimension. The semantic proposal advocated in this thesis is to understand coordination as a relation that is semantic in status but holds between vehicles of content[90]. In other words, the coordination relation as understood here shares its status with coordination as Fine understands it, but its relata with the relation Heck proposes. As a result, it shares Heck's view on the essential importance of representations, but it also accepts with Fine that coordination is part of the semantics, and therefore theoretically and conceptually independent of representational vehicles. To the extent that the semantic status of the relation is the fundamental issue, however, the alternative proposal offered in this thesis evidently remains a variant of Semantic Relationism.

[90] The relata of coordination so understood are thus necessarily mental objects with syntactic properties, which is why the current proposal accepts the intuitive restriction that for something to have semantic properties, it has to have syntactic properties, which is not something Fine can accept.

As highlighted by Heck, Fine holds that coordination is a relation between the contents of expressions[91]. A major motivation for this idea is Fine's attempt to develop Relationism as a version of Referentialism:

> "[T]he book is [...] an attempt to defend a referentialist position within the philosophy of language"
> (Fine 2009: 5)

Referentialism is of course the view that all content is referential. So if coordination is part of the semantic content, then it has to be referential as well, which means that one takes coordination to stand for something, to be about something:

> "[t]he natural way to proceed is to let differences in coordination among names show up as differences in coordination among the objects to which they correspond."
> (Fine 2009: 55)

Heck evidently agrees with Fine that semantic content is purely referential. But unlike Fine, he concludes that the relevant relation is not content. For him, the formal relation captures a difference in how something is represented, which is a difference in representational vehicle, rather than in what is represented, its content. In contrast to both Heck and Fine, the current proposal is that coordination holds between representations but is part of the semantic content. Hence, the proposal agrees with Heck that differences in coordination represent differences in how things are represented, but understood in a Fregean manner, in much the same way as Fregeans think of differences in sense or mode of presentation as differences in how things are represented as a matter of semantic content. As coordination relations are content but not referential, the view accepts that content is not purely referential. Hence, in this respect Semantic Relationism is better understood as a variant of Fregeanism than Referentialism on the proposed view.

Heck also mentions as a distinguishing feature of his view that representations (or the vehicles of content) are for him essential for representation (or semantic content). Clearly, it makes sense to keep in mind what a semantic theory is a theory of when assessing its merits. As the current view holds that coordination is essentially a relation between mental representations, it subscribes to Heck's view that mental representations are essential for semantics. Even so, the supposed difference with Fine in this respect is not substantial, but rather reflects a difference in theoretical objective. In his main contribution on Semantic Relationism, Fine is preoccupied with the general principles of a Relationist semantic theory. In stark contrast, the main goal in this thesis is to assess the potential of the theory by applying it to solve problems that arises for certain fundamental theories in cognitive science and psychology, namely the computational and representational theory of mind as based on the Language of Thought hypothesis. However, it is only when interested in the application of a semantic theory in support of empirical theories that it becomes crucial to determine the actual relata of semantic coordination. Only then mental representations become fundamental. Hence, whether representations are essential for semantic theory depends on the explanatory goals of the theorist. A logician who needs a semantic theory to properly understand inferential relations need not be concerned with mental representations, while a cognitive linguistic or a psychologist does. In comparison to Heck's, this view on the role of mental representations for semantic theory is more plausible as it does not burden the logician with unnecessary considerations

[91] In personal conversation, Fine states that he no longer holds that view, however.

of a cognitive nature, while it still accords a fundamental status to mental representations in the empirical domains affected by Frege's Puzzle. Having said that, the next chapter finally presents and discusses Fine's original Relationist contribution to semantic theory.

Chapter 2

Systematic Introduction to Semantic Relationism

2.1 Introductory Remarks

The previous chapter clarified the role of Frege's Puzzle for semantic theory and offered an initial comparison between Semantic Relationism and existing proto-Relationist theories. This already elucidated the main idea behind Semantic Relationism, which is to posit a semantic coordination relation in addition to reference that is in many respects analogous to the identity relation between Fregean senses. The aim in this chapter is to explain Semantic Relationism in more detail. The chapter first provides the basic tenets of a Relationist semantics and shows how it can solve the different variants of Frege's Puzzle. It then briefly reiterates the differences between Semantic Relationism and the proto-Relationist theories considered in the previous chapter, before adding an important clarification about the theory. The final part then presents the aspects of the theory in which the proposal offered in this thesis deviates from Fine's original proposal.

Fine starts his discussion of Semantic Relationism with an interesting observation. When reflecting on the fascinating nature of language, people generally focus on the fact that it allows its users to express a myriad of different things. Fine observes that an equally remarkable but much less noted fact is that it allows its users to say the same thing repeatedly (2009: 1). Language enables its users to express the same thought on different occasions. The reuse of thoughts is in turn essential for various capacities such as inferential reasoning, memory, the ability to track objects, and communication, which are vital for the human capacity to make sense of the external world. It is therefore crucial that a semantic theory enables thoughts to be properly identified over time.

The main motivation in this chapter is to outline Semantic Relationism so it can be used as a theory of content for the Language of Thought. A major objective is to show in subsequent chapters that unlike Referentialism and Fregeanism, Semantic Relationism provides an adequate semantic theory for the Language of Thought. The ulterior aim is to restore the viability of the Language of Thought hypothesis in the light of semantic concerns, which suitably leaves its empirical adequacy as the remaining criterion for the assessment of the hypothesis. Fine's initial motivation for his semantic theory is radically different. It originates in an attempt to explain the semantics of variables in formal languages. The basic idea is roughly that two distinct variables,

"x" and "y", differ in content, as shown by the difference between "x=x" and "x=y", even though there is nothing intrinsically different about them, as shown by the fact that "x=0" and "y=0" do not differ semantically but only notationally (2009: 7). Prima facie, it is hard to uphold the Fregean idea that typographically distinct variables differ in sense or mode of presentation of the number they variably stand for. As formal languages are not a concern in this thesis, however, the application of a Relationist semantic theory to variables in formal languages is not discussed.

Another important point is that Fine approaches language and thought in a parallel fashion (2009: 67)[1]. On the approach to language and the mind advocated in this thesis, this parallel approach is justified, as according to the Language of Thought hypothesis, thought is based on a language-like system which alone has semantic content strictly speaking. Fine's motivation for this parallel approach, which also assumes that there is only one "system of representation", is based, in contrast, on the familiar idea that the "English speaker by and large thinks in English and the French speaker in French" (2009: 77). Although this idea is radically mistaken on the current proposal, the outcome is the same, namely a strong analogy between thought and language. The dispute is therefore largely orthogonal to the discussion of a Relationist semantics provided in this chapter.

In the previous chapter, coordination was introduced as a semantic relation. Fine speaks of coordination as semantic relation when speaking about the semantics of natural languages, but he refers to coordination as a representational relation when speaking about thought (2009: 66). Similarly, Fine uses co-representation instead of co-reference to signify that two proper name-like constituents of thought are about the same object (2009: 66). Given the strict parallelism noted above, however, there is no substantial difference between both ways of speaking. The thesis therefore speaks of co-reference and qualifies coordination as a semantic relation throughout. Moreover, on the proposed approach, the representational nature of thought is in fact due to its semantic content, and the representational nature of natural language is derived from the representational nature of thought[2].

Fine explains and defends his semantic theory independently from the Language of Thought, which is reasonable as the Language of Thought hypothesis is irrelevant for many issues that allow for the assessment of the merits of Semantic Relationism[3]. There is one important issue, however, where

[1] Fine uses the terms "language" and "thought" in an intuitive sense. This terminology is adopted in this chapter as well, but it is replaced subsequently with a much stricter terminology. The term "language", if unqualified, is always taken to refer to a natural language. Thoughts, in contrast, always refers to sentences in the Language of Thought, which is a language-like, syntactically structured, system of mental representations. Although both natural languages and the Language of Thought are mentally represented, a main difference is that the mental representations of natural language are very different between, say, a Chinese and a German speaker, while the underlying mental representations of the Language of Thought are not, as the Language of Thought is biologically determined and thus largely independent of the language spoken. Thoughts are also the content-bearing components of mental attitudes such as belief. That way, thoughts differ from beliefs in terms of endorsement. A speaker has the belief that p if he mentally endorses the thought that p. This distinction between thought and belief is important for the theory of communication. If a speaker says that p then a hearer must form the thought that p for the communication to be successful, but the hearer need of course not believe that p. It is only if the hearer trusts the speaker that he or she will also believe that p. Thoughts are thus akin to Fregean statements with only the horizontal content stroke, while beliefs are the mental equivalent of a statement with Frege's vertical judgment stroke added.

[2] In this respect, the Language of Thought hypothesis is the thesis that intentionality, or the representational nature of thought, is a matter of semantics. Hence, a semantic theory for syntactically structured mental representations fundamentally explains how thoughts relate to the world, albeit by taking some semantic relations, notably reference and coordination, as primitives.

[3] In personal conversation, Fine asked why one should think that the Language of Thought hypothesis is necessary to defend a Relationist semantics. That is not the view defended here, but rather the inverse: a Relationist semantics is necessary if one adopts the Language of Thought hypothesis. That way, the plausibility of the Language of Thought speaks in favor of a Relationist semantics.

this is not the case. Considering an individual thinker, or cognitive system, the current proposal maintains that the semantic relation of coordination is grounded in the identity of the syntactic symbol used in the Language of Thought[4]. Two proper name uses are thus coordinated in thought if a cognitive system uses the same symbol to interpret them. In fact, this is plausibly the reason why the symbols are semantically coordinated, which in turn explains how a cognitive system is able to keep track of coordination relations. Fine rejects this idea, however:

> "[Thoughts] provid[e] [...] yet another reason not to think of coordination syntactically in terms of the repeated use of the same symbol. For in the intentional cases, it may be hard to say what the symbol or symbol-surrogate should be taken to be."
> (Fine 2009: 73)

With the Language in Thought hypothesis, there is manifestly no such difficulty[5]. On the proposed view, people keep track of individual objects by having a unique symbol for them in their Language of Thought, which symbol is the mental equivalent of a proper name. In the philosophical literature, a well-known view is to speak of "mental files" instead, which are mental folders in which people store information about distinct individuals (Schneider 2009a: 11; 2009b: 532). As does Fine, the current proposal considers this way of speaking metaphorical at best, which means that mental files should be understood in terms of coordination (2009: 68). Beliefs about unique individuals are "collected" in a "mental file" about that individual in virtue of containing coordinated proper names for that individual. Unlike Fine, this is in turn understood in terms of syntactic symbol identity. The proper names in the beliefs are coordinated by virtue of being realized by the same syntactic symbol in the Language of Thought sentences that constitute the content-bearing components of the beliefs. This idea emerges rather naturally on a Language of Thought based approach to the mind, and it provides a concrete rather than metaphorical suggestion as to what mental files are. Importantly, however, the claim that coordination is based on syntactic symbol identity within individual minds does not amount to the claim that it is equivalent, or even reducible, to syntactic symbol identity. An initial reason is that there are cases of coordination, namely intersubjective coordination, that do not have a syntactic basis. Secondly, even in the intrasubjective cases, coordination remains semantic relation, which is part of the semantics of the language, while the identity relation between syntactic symbols is a matter of syntax. One reason this is important is that it is generally assumed that the contents of thought are consciously available but the vehicles of thought are not. If so, coordination is the conscious semantic counterpart of the cognitively inaccessible syntactic symbol identity relation.

The basic view endorsed in this thesis is that Semantic Relationism provides the adequate theory of semantic content for the Language of Thought. To clarify, this means that mental representations have syntactic properties and semantic content, which consists in the fact that they stand in reference relations to objects in the world and in coordination relations to each other. Taking the Language of Thought for granted, this view has two main rivals. First, a purely Referentialist view, on which mental representations only refer, and a Fregean view, on which mental representations additionally express senses (2009: 74). On a Fregean semantics for the Language of Thought,

[4] The notion of grounding is used here without ulterior metaphysical motives. It just means that some relation is based on, or due to, another relation. The thesis remains neutral on metaphysical questions such as how the semantic relation of coordination is metaphysically based on the non-semantic one of syntactic symbol identity.

[5] Fine's alternative, which is to think of coordination in thought as a relation between occurrences of objects, is discussed and rejected later on.

grasping the sense of a natural language expression then amounts to translating it into the mental representation that expresses the correct sense[6].

As mentioned, on the current proposal there is a fundamental difference between intrasubjective and intersubjective coordination in terms of how they are grounded. Fine introduces Semantic Relationism by focusing exclusively on intrasubjective coordination, and only later devotes an entire chapter to intersubjective coordination between speakers (2009: 86)[7]. This chapter follows Fine's approach in this regard, for two reasons. First of all, it is not necessary to focus on intersubjective coordination and on how it differs from its intrasubjective counterpart to present the core idea of Semantic Relationism. Secondly, intersubjective coordination plays a major role later for Frege's Puzzle for the Language of Thought, on which occasion it is discussed extensively.

2.2 Frege's Puzzle

Fine discusses Frege's Puzzle using the example of Marcus Tullius Cicero, a famous Roman orator and politician referred to in English by the names "Cicero" and "Tully". The corresponding identity statements are "Cicero = Cicero" and "Cicero = Tully". They are subject to Frege's Puzzle because of the joint inconsistency of the following four principles (2009: 34)[8]:

(1) Semantic Difference:
The two identity sentences are semantically different.

(2) Compositionality:
If the sentences are semantically different, then the names "Cicero" and "Tully" are semantically different.

(3) Referential Link:
If the names "Cicero" and "Tully" are semantically different, then they are referentially different.

(4) Referential Identity:
The names "Cicero" and "Tully" are not referentially different.

Focusing on beliefs, the corresponding principles can be formulated as follows [9]:

(5) Semantic Difference:
The two identity beliefs are semantically different.

(6) Compositionality:
If the beliefs are semantically different, then the belief constituents corresponding to the names "Cicero" and "Tully" are semantically different.

[6] For example, "Hesperus" has to be translated into the singular concept HESPERUS, which has the correct sense, unlike PHOSPHORUS. On the proposed view it would of course be more correct for the Fregean to say that one grasps the meaning of a natural language expression, as natural language expressions are assumed not to have semantic content properly speaking, so that they do not strictly speaking express or have senses.

[7] In this vein, Fine also speaks of "external links" of coordination (2009: 93)

[8] Fine discusses the analogous cognitive version of the Puzzle later on (2009: 75).

[9] The principles can also be formulated in terms of thoughts, which are the content-bearing components of beliefs.

(7) Referential Link:
If the belief constituents corresponding to the names "Cicero" and "Tully" are semantically different, they are referentially different.

(8) Referential Identity:
The belief constituents are not referentially different.

The basic challenge then is to decide which of the first three principles has to be given up, and why. Clearly, giving up (8) is not an option, as both proper names refer to the same Roman orator. Fine notes that Referentialists reject (5), while Fregeans reject (7). Hence, Referentialists claim that despite initial appearances, both identity statements in fact have the same content. Fregeans, in contrast, maintain a difference in content which they trace back to a difference in sense between the two proper names.

2.2.1 Against Referentialism

Fine does not provide a profound argument against Referentialism. However, he notes that for the reasons already mentioned by Frege, the Fregean view is more plausible (2009: 35). Fine's main issue with Referentialism is that in the case of belief, it is simply implausible to reject (5) and to claim that both identity beliefs have the same content:

> "It must be allowed, in other words, that the objectual components of the two beliefs are not the same even though the objects are. This immediately raises the question of what the objectual component might be and, again, the only plausible view is that it is something akin to a Fregean sense or manner of presentation. Thus the content of the belief on this view will include, or involve, a mode of presentation by which its object is given."
> (Fine 2009: 76)[10]

Fine's overall argument is that since Referentialists have to accept that co-referential beliefs are different even if they are about the same object, their view collapses into a Fregean view. The reason is that they have to invoke "guises" in order to maintain that the beliefs have the same content, so as to explain how this may not necessarily be apparent to a believer. Fine contends, however, as was confirmed in the previous chapter, that on the most plausible assumption theses "guises" are rather similar to Fregean senses (2009: 77). Hence, Fine maintains that a version of Referentialism that appeals to "guises", which appears necessary in the case of belief, in fact amounts to "back-door Fregeanism" (2009: 76).

As Frege before, Fine notes that co-referential proper names differ in terms of inferential potential. For instance, someone who believes that Cicero is a Roman and Cicero is an orator can mentally infer that Cicero is a Roman orator. Upon reflection, this person is thus able to form the resulting belief that Cicero is a Roman orator. This is not possible if the person believes that Cicero is a Roman and Tully is an orator instead. If the person fails to believe that Cicero is Tully, then he or she is in no position to infer the existence of a Roman orator. As a result, the corresponding

[10] The "objectual components" here are the belief constituents corresponding to the proper names, which are often called singular concepts in the literature. On the current proposal, they are mental representations which proper name-like expressions in the Language of Thought.

belief can not be justifiably formed, even upon careful reflection. The well-known problem for Referentialism is that the beliefs that respectively provide the premises for the inference have the same content. So how can the Referentialist explain the difference in inferential potential between the co-referential beliefs? One option Fine thinks the Referentialist has to avoid adopting the Fregean position is "to go linguistic":

> "It would be supposed, in the first case, that the hearer knows the truth of the sentences "Cicero is Roman" and "Cicero is an orator." From these, he infers the truth of the sentence "Cicero is a Roman orator"; and from this, he then infers, given his understanding of the language, that Cicero is a Roman orator. Thus he makes the required inference at the level of language and it is only once he has made the inference at this level that he descends to the level of thought. In the second case, by contrast, the corresponding inference at the level of language cannot be made and so the speaker has no means of acquiring the relevant non-linguistic information."
> (Fine 2009: 81)

The main idea is that inferential reasoning is effected through language, that is, by the use of the sentences that express the beliefs. Since the sentences contain different proper names for Cicero, the Referentialist can appeal to this fact to account for the difference in inferential potential between the underlying beliefs. Fine stresses two problems for this proposal, however. First of all, it entails that thinking always proceeds via language (2009: 81). It is very implausible, however, to assume that people have to engage their linguistic capacities every time they reason inferentially. Secondly, there are cases where this strategy fails, namely in cases where the corresponding sentences contain the same proper names, as in Kripke's famous "Paderewski" examples (2009: 82). Fine concludes that Referentialism about the content of thought is not tenable. It either has no plausible answer to Frege's Puzzle or it is in effect equivalent to a Fregean view on the content of thought[11].

However, there is one important option Fine fails to consider at this point. Fodor, who is a Referentialist, argues that the co-referential beliefs in question to do not differ semantically, but only syntactically (Fodor 2008: 61). Presumably, Fine omits this option because he assumes it is not possible to appeal to syntax in the case of thought, as it is not like a natural language and thus without clear syntactic constituents. On the Language of Thought hypothesis endorsed by Fodor, however, this assumption is false. As a result, the proposed Referentialist solution does not collapse into Fregeanism, as the difference in "guise" between co-referential beliefs, and so between co-referential belief constituents, is not a matter of their semantic content, but a difference in representational vehicle. Fine maintains that the view that there is no difference in content between the informative and the non-informative identity belief is counter-intuitive, but that is not a defeating objection, and a consequence Fodor is willing to accept. Moreover, Fodor's proposal can easily explain the difference in inferential potential. Since on his view reasoning is computation performed on mental symbols, it is obvious that a cognitive system is sensitive to the symbolic vehicle used to present a certain content, and not just the content itself. It is also clear that this proposal does not entail that reasoning relies on a natural language. And finally, Paderewski cases

[11] To be precise, Fine thinks that most self-described Referentialists are Referentialists about the semantics of language and pseudo-Fregeans about the semantics of thought. Since both options are equally unsatisfactory, however, this distinction is not vital for current purposes. Fine points out that this mixed view has the additional drawback that it entails that people cannot say exactly what they think nor think exactly what other people say to them, given the fundamental difference in content between thoughts and language.

are not a concern for this proposal either, as the different uses of a homophonic proper name will be reflected in thought by the use of distinct mental symbols. Accordingly, Fodor offers a version of "pure" Referentialism to solve Frege's Puzzle against which Fine has no convincing argument. Even so, the thesis later argues that Fodor's proposal still fails, in view of the shortcomings it has in terms of defining the sameness of content necessary to account for successful communication. The reasons why Fodor's proposal fails are explained in great detail later on. For now, suffice it to say that even if Fine does not undermine this alternative to a Relationist semantics for thought and belief, the Relationist has the necessary arguments to do so.

2.2.2 Against Fregeanism

As mentioned, in Fine's opinion the Fregean has the more plausible response to the inconsistency of the four principles, at least at first glance[12]:

> "We have an intuitive notion of meaning and it seems evident, for this intuitive notion, that the two identity-sentences differ in their meaning"
> (Fine 2009: 35)

Fine remarks that this intuitive understanding of content is substantiated by certain types of explanation. For instance, it is evident that one learns something interesting upon first finding out that Cicero is Tully, which is not the case if one learns that Cicero is Cicero[13]. The question then is how to explain this difference in epistemological value if not by assuming that the two statements say something different, which is tantamount to saying that they differ in content. The main problem Fine sees for the Fregean is to specify how exactly the co-referential proper names differ in content:

> "The main problem with the Fregean position, to my mind, is to say, in particular cases, what the difference in [...] sense of the names might plausibly be taken to be. Although there appear to be good theoretical reasons for thinking that there must be a difference, it seems hard to say in particular cases what it is. For as Kripke [...] has pointed out, it seems possible for a speaker [...] to associate the same beliefs or information with two names, such as "Cicero" and "Tully." And if the information or beliefs are the same, then how can the sense be different?"
> (Fine 2009: 35)

So Fine argues that the Fregean has good theoretical reasons to claim that "Cicero" and "Tully" differ in content because they differ in sense, and that such a difference in sense is usually due to a difference in the way the reference is presented. However, if a speaker only knows about Cicero that he was a famous Roman orator also called Tully, in what sense can one really say that Cicero is presented to the speaker in two different ways? The only intuitive difference that comes to mind is the use of distinct names. So in one case, Cicero is presented as the Roman politician called "Cicero", and in the other case he is presented as the Roman politician called "Tully". As

[12] As mentioned repeatedly, "meaning" and "content" are used interchangeably here. Ultimately, the view is that "content" is the right notion for thought and belief, while "meaning" applies to natural language expressions and captures the knowledge necessary to correctly translate them into thought. However, everything Fine says about "meaning" applies to content as well.

[13] In the latter case, it is hardly intelligible to even imagine learning its truth for the first time, as Cicero's self-identity was ever in doubt.

seen, however, Frege already points out that this strategy has substantial drawbacks. The strategy actually fails for even more obvious reasons. It is possible to raise the same Puzzle using a unique name, as in Kripke's famous "Paderewski" examples, in which case there is no difference in name to appeal to. This indicates that even in cases where there is a difference in name, this is not the critical difference[14].

Fine credits Fregeans with being very resourceful in defending their theory, so he tries to come up with an example that makes it impossible for Fregeans to even consider a difference in sense (2009: 36). His example is based on a subject in a "universe that is completely symmetric around someone's center of vision" (2009: 36). The basic idea is that the subject has a unique name, "Bruce", which refers to what the subject thinks are two people, Bruce appearing on the left and Bruce appearing on the right[15]. Bruce happens to be one and the same person, however, so that both uses of the name are co-referential[16]. Given that the universe is perfectly symmetrical, there is no qualitative difference between the left and the right side. But the Fregean has to maintain that there is a difference in sense between the two uses of the name "Bruce", as shown by the fact that one can state an informative identity by means of them to ascertain that the Bruce on the left is identical to the Bruce on the right. The challenge for the Fregean then is to say what the difference in sense amounts to, given that the universe is perfectly symmetrical (2009: 36, 71).

Even if this thesis endorses Semantic Relationism, it does not rely on this argument in favor of it, for three reasons. First of all, as Sosa points out, "[a] first issue is whether the example is so much as coherent" (2010: 351). The main concern is whether it is sensible to assess the merits of a semantic theory on the basis of a world that is so radically different from the one in which language occurs as a matter of empirical fact. In virtue of its radical departure from reality, the example differs substantially from the usual variants of Frege's Puzzle discussed in the literature. The standard cases are mostly exaggerated and artificial, even artful, examples of everyday situations, but they remain realistic in that they combine actually observable features, even if do so in a way that is not necessarily realistic, which they do to make a point. This is no longer the case in Fine's example, however, as it is based on the use of language in a situation that is entirely different from anything even remotely possible in reality[17]. A Fregean may therefore reasonably wonder why his semantic theory has to take such impossible situations into account. As a result, Sosa's skepticism about the example is justified, even if not for exactly the reasons he mentions. Sosa is "doubtful that a subject can conceive entities as distinct without distinguishing them in some way" (2010: 351). The more general worry, however, is whether one can draw reliable conclusions about how language can be used from examples in a world that is so radically different from the real world.

Secondly, it is not obvious that the example is effective against all versions of Fregeanism. Fine admits that it is restricted to descriptive versions of the theory, which assume that every sense contains a distinct and uniquely identifying description of the reference (2009: 36). These versions

[14] It would arguably be better to use only examples with the same name, but in line with Fine and other literature, this is not done here for the sake of ease of understanding.

[15] As Fine points out, there is of course no conceptualization of the universe as being divided between the left and the right, as that would introduce a asymmetry.

[16] In this section, Fine's notion of a "use" of a name is used as well, which is neutral on what constitutes such a use. On the current proposal, uses of names are individuated by an underlying singular concept in the Language of Thought. A use of a name is thus constituted by the identity of the underlying Language of Thought symbol.

[17] There of course cases of symmetry, but the argument here needs perfect symmetry. And even with perfect symmetry, Fine has to rely, by his own account, on there not being a possible conceptualization of the universe as "left" and "right", which it is hard to imagine ever being the case.

of Fregeanism are undermined by the example because it is impossible to provide such descriptions of the two perceived persons called "Bruce" in view of the perfect symmetry. Fine is aware of this limitation, however, and considers two possible responses a Fregean may envisage. The first is to adopt a more "liberal view of sense", thus allowing the Fregean to maintain either that the sense is determined by how the object is currently "picked out" or by how the object is originally "picked out" (2009: 37). Fine counters that both options are useless as a general approach, however. The "current" approach fails as one cannot always pick out the reference in the same way. Hence, senses would differ on every occasion of use of a proper name, which contradicts the Fregean doctrine that the sense of a proper name is constant[18]. The "original" approach in turn fails because it unrealistically requires speakers to remember how the reference of a proper name was first picked out if they are to remember the sense of a name[19]. Even if one accepts these points, however, the example is arguably still not effective against all versions of Fregeanism. Fine's example in fact speaks only against Fregean views based on the identification of senses with modes of presentation, which entail that differences in sense necessarily correspond to a qualitative difference of some sort. In the previous chapter, a version of Fregeanism was presented that rejects this identification, however. Sainsbury rejects the idea that senses are, or contain, modes of presentation, and he would claim that there is a difference in sense between both uses of "Bruce" while repudiating Fine's demand to give a deeper explanation:

> "to invoke [a] difference of sense is simply to redescribe the phenomenon in the theorist's preferred vocabulary. It is not to acquire access to some potentially explanatory but distinct fact."
> (Sainsbury 2002: 127)[20]

Hence, a Fregean such as Sainsbury will reject Fine's argument by rejecting the unreasonable explanatory standard it presupposes[21].

Finally, there is no need to rely on this far-fetched example to argue against Fregeanism, as there are much more realistic examples due to Kripke for which Fregeanism fails. Kripke's examples challenge Fregeanism on the basis of the fact that sense-identity is necessarily a transitive relation. Besides being more realistic, these cases have the additional benefit that they undermine the Fregean explanatory strategy altogether, which is to say that they disprove even the very minimal version proposed by Sainsbury.

As a result, Sosa is right that Fine puts too much weight on this example to undermine Fregeanism (2010: 358). To the extent that Sosa thinks this shows the viability of Fregean sense theories, however, he is still mistaken. The reason is that Fine also uses Kripke's variants of the Puzzle against Fregeanism, which is a fact Sosa ignores entirely. These cases therefore constitute the main argument against Fregeanism in this thesis.

[18] This feature is clearly essential to Fregeanism. If senses can change, phenomena such as memory, say, are no longer explicable as the retention of beliefs containing thoughts that express the same sense.

[19] This feature is again essential. People would no longer know the content of their beliefs about some object if they forgot how it was first picked out by them.

[20] Importantly, for Sainsbury the re-description in terms of sense is not just an empty re-description, since accounting for the phenomena in terms of senses serves to connect the explanation to other phenomena that are explained on the basis of senses.

[21] More precisely, Fine example undermines views based on the idea that there is an identical mode of presentation underlying every case of sense identity. A slightly weaker Fregean position not affected by this argument would maintain that for every case of sense identity, there is an underlying identity in mode of presentation. It seems that Sainsbury could at least adopt the weaker Fregean position.

2.3 The Relationist Solution

Fine notes that there good reasons in favor of both the first principle, which states that the informative and the non-informative identity statement differ in content, as well as the third principle, which states that proper names have only reference as their content. His suggestion is therefore the following:

> "[W]e should perhaps take more seriously the possibility of rejecting the assumption of Compositionality that puts them in conflict. For we might then affirm both that there is no semantic difference between coreferential names, thereby securing the benefits of the referentialist position, and that there is a semantic (or cognitive) difference between the identity-sentences, thereby securing the benefits of the Fregean position."
> (Fine 2009: 37)

How can compositionality possibly be denied, however, given that it constitutes the backbone of linguistic analysis (2009: 38)? Fine's key insight is that the classical principle of compositionality is in fact based on two distinct tenets, Compositionality Proper and Intrinsicality (2009: 39)[22]:

(9) Compositionality Proper:
If the identity-sentences "Cicero = Cicero" and "Cicero =Tully" are semantically different, then so are the pairs of names "Cicero", "Cicero" and "Cicero", "Tully".

(10) Intrinsicality:
If the pairs of names "Cicero", "Cicero" and "Cicero", "Tully" are semantically different, then so are the names "Cicero" and "Tully."

Fine's fundamental claim then is that the classical principle of compositionality can be rejected by virtue of the rejection of Intrinsicality rather than Compositionality Proper. There are two main aspects to this claim. On the one hand, this amounts to the claim that the pair of names "Cicero" and "Cicero" is semantically different from the pair of names "Cicero" and "Tully", without the names "Cicero" and "Tully" as such being semantically different. On the other hand, this means that the classical principle of compositionality is otherwise unaffected, which is to say that it remains in effect to explain the content of complex expressions as a function of their syntactic structure and the content of the basic expressions they contain.

What does it mean, though, to say that the pair of names "Cicero" and "Cicero" is semantically different from the pair of names "Cicero" and "Tully"? According to Fine, the difference between both pairs is a difference in semantic relationship that holds between the two expressions in the respective pairs:

> "There should, in other words, be a semantic relationship that holds between "Cicero" and "Cicero" yet not between "Cicero" and "Tully"."
> (Fine 2009: 39)

[22] As emphasized repeatedly, this section follows Fine in speaking of the proper names in a natural languages having semantic content. On the current proposal, the correct way to describe the proposal is actually to speak about the semantic content of singular concepts, which are mental representations that are the counterparts of natural language proper names in the Language of Thought. As is the custom in the literature, these singular concepts are referred to by words in upper case letters, as in "CICERO". Everything Fine states here can be easily reformulated in this vocabulary, but there is no need to do so in order to present the main ideas behind Semantic Relationism.

In other words, both "Cicero" expressions that occur in the first identity statement stand in the semantic relation of coordination, while the two expressions "Cicero"and "Tully" do not stand in this semantic coordination relation (2009: 40). As this coordination is part of the content of the non-informative identity statement, it follows that its content is different from the content of the informative identity statement. Both complex expressions are thus semantically different by virtue of the difference in content between the respective pairs of names they contain[23]. But how is this semantic relation of coordination in turn to be understood? Fine replies as follows:

> "it is somehow part of how the names represent their objects that the objects should be the same."
> (Fine 2009: 39-40, cf. 68)

This explanation highlights the similarity with the Fregean view on which the difference between co-referential proper names also lies in how they present their object. The crucial difference is the essential use of the plural. It is the names pairwise that differ in how they represent their object rather than the individual names as such. In other words, the difference lies in how the two proper names jointly represent their objects respectively, which in turn is not explicable in terms of how these proper names individually represent their object:

> "there is no intrinsic semantic feature of the expression, the way it represents its object, whose common possession accounts for the two expressions representing the object as the same."
> (Fine 2009: 42)

Fine highlights an important contrast to clarify his the main proposal. While in the informative identity statement the pair of proper names is used to represent their object as being the same, in the non-informative identity statement the pair of proper names is also used to represent their object as the same (2009: 40)[24]. Semantic Relationism thus introduces coordination as a primitive semantic relation that is based on two definitional features. Coordination is essentially semantic and essentially relational (2009: 40). The first feature means that coordination is part of the semantics or content of a language. The second feature entails that coordination is not reducible to an intrinsic semantic feature of the expressions that are its relata.

At this point, it is helpful to contrast the proposed approach to some of its best-known alternatives. One view that in fact rejects both features of the proposal - the semantic and the relational - is the idea that the identity statements differ in logical form (2009: 41). On this view, the explanation of how the identity statements differ is pre-semantic and based on the intrinsic syntactic identity of the proper names contained in the identity statements. Fine's objection to this idea is to challenge its proponent to explain why it is correct to assign a specific logical form to one statement but not the other. Why, in other words, is it correct to analyze the non-informative identity statement as having the logical form "a=a"? Evidently, the fact that both proper names have the same reference is not enough. Moreover, it cannot simply be a matter of the same name being used either, as it is possible to raises the Puzzle using a unique name, in which case the correct analysis of the logical form of informative identity statement will be "a=b" despite the fact that the same name is used.

[23] As mentioned already, this entails that not all the semantic constituents of a complex expression are also syntactic constituents, if the syntactic constituents are taken to be those that are represented by a node in the syntactic tree.

[24] It is important that this is an clarification and not a definition of coordination, as representation as the same is necessarily transitive, while coordination is not.

Admittedly, at this point it matters whether the Puzzle is raised for natural language sentences or for thoughts. For thoughts or beliefs, the logical form proposal in fact corresponds to Fodor's well-known idea that the informative and the non-informative beliefs differ syntactically rather than semantically. Fodor makes this suggestion to argue that there is no need to appeal to a Fregean sense theory as one can understand modes of presentations "syntactically". For Fodor's proposal, the question what logical form to assign is not a substantive worry, as it simply depends on the symbols used in the Language of Thought sentence underlying the belief[25]. Moreover, the case with the same proper name is no longer a concern either, as the ambiguity that exists on the level of natural language is not replicated on the level of thought. As before, the considerations mentioned by Fine at this point do not appear to undermine this specific proposal for belief, even if there are other considerations that do[26].

The familiar Fregean alternative results from accepting the semantic part of the proposal while rejecting the relational part (2009: 42). The Fregean accepts that there is a difference in how each pair of names represents their objects, but also thinks that this can be explained by means of a difference in how each name individually represents its object, as reflected in the semantic theory by a difference in sense. Against this idea, Fine reemphasizes the cases that a problematic for the Fregean, notably his example of a symmetrical universe.

In addition to the Fregean suggestion, there are clearly other options Fine does not consider at this point, most notably the pragmatic proposal. This option and several others were already discussed in the previous chapter, where it was also argued briefly that they are problematic. For instance, whatever the merits of the pragmatic approach to solve Frege's Puzzle for natural language, it is clear that the same strategy is not available to solve the Puzzle for belief, which means that proponents have to resort to a different approach. Another important option just mentioned is the Referentialist position occupied to Fodor, which avoids the criticism Fine offers here. Accordingly, Fodor's view remains a contender to solve Frege's Puzzle for the Language of Thought, which is why it is included later in the main discussion that aims to show in detail why all the alternatives to Semantic Relationism ultimately fail to solve Frege's Puzzle for belief.

As mentioned, the current proposal maintains that within individual thinkers or cognitive systems, the semantic coordination relation is realized in virtue of the identity of the underlying syntactic symbols. Even so, this does not amount to the Fodorian view on which a semantic relation, be it sense-identity or semantic coordination, can be replaced by a syntactic identity relation. In this respect, it is important to distinguish three fundmantal questions that can reasonably be asked in light of Frege's Puzzle. The first question is what distinguishes an informative from an uninformative identity statement. The second question is why people consider proper names coordinated in some cases, but not in others. A third questions pertains to the question how people represent proper names as being coordinated once it is decided that they are indeed coordinated. These different questions are not always as clearly separated as they should be. Sosa for instance confounds the last two questions in an attempt to criticize Fine, when Fine is in fact almost exclusively concerned with answering the first question about the semantic difference between co-referential proper names:

[25] This does not address the epistemological question of why to assign a given logical form, in the sense of what evidence it is based, but that is irrelevant for the issue at hand.

[26] More about this in the discussion on the intersubjective variant of Frege's Puzzle for the Language of Thought.

> "But why [are proper names coordinated]? What explains the obtaining of the coordination or its absence? In virtue of what do contents of thought get coordinated?"
> (Sosa 2010: 356)

The answer to the first question is to posit semantic coordination as a primitive semantic relation as part of the project of developing an adequate semantic theory. The second question as to why people assume there is coordination in some cases but not others is not a matter of semantic theory, but depends the background beliefs and features of the context that hearers rely on for their best guess as to what a speaker intends to communicate. For instance, if a person is told by a speaker that the speaker only recently realized that Paderewski is Paderewski, the hearer can rely on the Gricean maxim of informativeness to judge that the names are most likely not being used in a coordinated manner. Importantly, answers to questions of this sort are entirely independent of the semantic theory adopted, which is why such questions cannot serve to undermine a Relationist semantic theory, as Sosa mistakenly seems to think. Finally, on the proposed view, the third question is a matter of Language of Thought syntax, as people represent coordinated used of names by means of the same Language of Thought symbol, and uncoordinated proper names by means different symbols. In other words, the question of how people represent coordination and coordinated proper names is a matter of syntactic symbol identity, which is neither a relational nor a semantic matter. This explains why the proposed view differs from Fodor's. On the current proposal, the appeal to syntactic symbol identity answers a question of the third type, while Semantic Relationism provides a response to question of the first type. Fodor's aim, in stark contrast, is to answer both the first and the third question by means of an appeal to syntax with the aim of making a two-tier semantic theory obsolete. Fine is also aware of the different questions in this regard, and in fact does not object to the proposed strategy:

> "I would not wish to deny that the semantic relationship – of representing-as-the-same – might hold in virtue of a syntactic relationship – of the name being the same. It is, after all, a common occurrence that a semantic feature or relationship can hold in virtue of an underlying syntactic feature or relationship [...] But either the syntactic feature or relationship is constitutive of the supposedly semantic feature or relationship, in which case it is not genuinely semantic at all, or it is not constitutive of it, in which case there is a further semantic feature riding upon the syntax, whose exact nature needs to be ascertained."
> (Fine 2009: 41-42)

Setting aside the metaphysical question about constitution, the main point is that even if the semantic relation of coordination holds in virtue of the syntactic identity relation, the relations are nonetheless distinct, one being part of the semantics and the other part of the syntax of a language. And as explained, an explanatory project needs both relations, as they are needed to answer distinct questions. Coordination explains what the difference in content is between the representation of an informative and an uninformative identity, and syntactic symbol identity explains how the mind is able to represent such semantically distinct identities.

2.4 Semantic Facts and Requirements

As seen, coordination is a semantic relation that holds between the basic referential constituents in thought. Fine at first suggests that coordination holds between two referential expressions if it is a semantic fact that they represent the same object, in which case one can say that these two expressions are strictly co-referential, as contrasted to being merely factually co-referential (2009: 43)[27]. This definition is based on three important distinctions. First of all, Fine distinguishes facts that are semantic as to topic from those that are semantic as to status (2009: 43). Topic semantic facts are all the facts that are about semantics:

> "Thus the fact that "the author of Waverley" [denotes] Scott [...] will be semantic in this sense"
> (Fine 2009: 43)

Facts are semantic as to status, in contrast, if they "belong to the semantics of a given language" (2009: 43). An example of this would be the fact that "Scott" refers to Scott. The basic distinction is that status semantic facts are purely semantic, while topic semantic facts also involve non-semantic considerations. For example, the fact that the description "the author of Waverley" denotes Scott is partly due to the purely semantic fact that the description is about the author of Waverley, and partly due to the not-semantic fact that Scott is the author of Waverley. The purity of status semantic facts is closely connected to the fact that knowledge of them is required for semantic competence. A person who fails to know that the description "the author of Waverley" denotes Scott can still count as semantically competent, but not if he or she fails to know that the description is about the author of Waverley. In other words, being mistaken about a status semantic fact shows a lack of semantic knowledge rather than lack of empirical knowledge. Similarly, a person who does not know that "Cicero is Tully" is true displays a lack of empirical knowledge, while a (rational) person who fails to know that "Cicero is Cicero", in the obvious and uninformative sense is true can only be taken to display a lack of semantic knowledge.

Fine's characterization raises a question about how this distinction is to be understood when semantic theory is taken to apply to the Language of Thought rather than a natural language, which is not interpreted or understood in the way a natural language is[28]. The basic idea is the same, however, the only difference is that a failure no longer shows a lack of semantic competence but a lack of rationality. A failure to mentally endorse the uninformative thought that Cicero is Cicero is not a semantic mistake, a misunderstanding of a language, but a display of irrationality[29]. The failure to endorse such a thought shows a malfunction of the rational capacities of a thinker[30].

[27] See also Ostertag (2009: 346).

[28] As a reminder, the current proposal is based on a very different underlying model about how language works. For Fine, knowing a natural language expression is to know its semantic content, which for a proper names is to know what it refers to and how it is coordinated with other proper names. On the current proposal, knowing a natural language expression is to know its meaning, which means knowing how to translate it into the Language of Thought expression with the correct reference and coordination pattern. Correctness in turn is determined by a linguistic community. Roughly, a natural language expression is correctly translated if it is associated with the Language of Thought expression that the majority of the linguistic community associate with it.

[29] There are two assumptions here. First, the thought is sufficiently simply so as not to raise performance issues. Secondly, the believer is not a philosopher who believes to have good reasons to deny the self-identity of some or all objects. Such a philosopher would probably still qualify as irrational, but one would not trace the irrationality to a breakdown of rational capacities.

[30] In this sense, Fine speaks of semantic requirements on thoughts as not being imposed by us, but on us (2009: 73-74). They are not conventional, but objectively necessary for the proper functioning of the cognitive system to serve its

A second if somewhat less important distinction is between semantic facts and semantic truths (Fine 2009: 44). For current purposes, semantic facts are part of reality, while semantic truths are sentences, and hence part of a language[31]. Accordingly,

> "one should distinguish between a semantics, which is a body of semantic facts, and a semantic theory, which is a body of semantic truths."
> (Fine 2009: 44)

In other words, semantics is what a semantic theory aims to correctly describe. For example, a semantic theory of English aims to correctly describe the semantics of English, and a semantic theory of the Language of Thought aims to correctly describe the semantics of the Language of Thought, which is a body of semantic facts that obtain about the Language of Thought. Even though this distinction is largely accepted here, the thesis continues to use semantic theory in the more philosophical sense in which it refers to a foundational theory about the nature of semantic content. It is in this sense that Semantic Relationism is a semantic theory that is fundamentally different from Fregeanism or Referentialism. This will not lead to any ambiguities, however, as the thesis is manifestly not concerned with offering a semantic theory in the sense alluded to by Fine at this point. The thesis does not engage in the linguistic analysis of any specific language such as English or German, or the Language of Thought for that matter.

The third distinction is between a broad and a narrow conception of facts (Fine 2009: 46). This distinction is important because of a principle of closure, which states that any logical consequence of a semantic fact is also a semantic fact (Fine 2009: 45). The problem then is the following. The definition of coordination states that two proper names are coordinated if it is a semantic fact that two expressions are co-referential. In that case, the names are said to be strictly co-referential, as opposed to being merely factually co-referential. However, if it is a semantic fact that "Cicero" refers to Cicero and that "Tully" refers to Tully, because of closure it will also be a semantic fact that they are co-referential, given that Cicero is Tully. Since coordination is then a consequence of the semantic facts about what the individual names refer to, strict co-reference collapses into factual co-reference. As a result, all co-referential expressions will count as coordinated, leaving coordination unable to fulfill its role in properly partitioning co-referential expressions.

From the previous point, the nature of the difficulty becomes apparent. The problem is that both premises are semantic as to status, but the conclusion relies on the non-semantic fact that Cicero is identical to Tully, which makes the conclusion only semantic as to topic. Accordingly, closure has to be given up, if not in a unmotivated and ad hoc manner (2009: 46). To do so, Fine proposes to distinguish manifest from classical consequences (2009: 48). A manifest consequence is any consequence "that an ideal but non-omniscient speaker would be able to draw" (Ostertag 2009: 346). For instance, an ideal reasoner who knows that Cicero is a Roman and that Cicero is an orator is manifestly able to conclude that there is a Roman orator. An ideal reasoner who knows that Cicero is a Roman and that Tully is an orator, in contrast, is not able to draw this conclusion, even if it follows from what is known that there is a Roman orator.

The two types of consequence separate the realm of semantic facts into two distinct domains (Fine 2009: 49). The first domain is a domain of facts, which contains everything that is a classical

biological purpose. The distinction between semantic requirements and semantic facts is explained in the next few paragraphs.

[31] On Fine's view, semantic facts are propositions, but the current proposal does not subscribe to that idea.

consequence of the known semantic facts. Hence, it contains everything that truly follows from the known semantic facts. The second realm is a domain of information. It contains everything that is a manifest consequence of the known semantics facts. Hence, it does not contain everything that truly follows from the known semantic facts, but only those consequences that can be known to be true given the knowledge of the semantic facts. As a result, the domain of information will not contain the semantic fact that "Cicero" and "Tully" are co-referential even if contains the fact that "Cicero" refers to Cicero and "Tully" refers to Tully, since this will not be manifest to someone based only on his knowledge of the semantic facts[32]. As a result, the domain of information contains only the consequences of the status semantic facts that are itself status semantic. In this sense, Fine maintains that the broad semantic facts are those facts that are a classical consequence of the semantic facts, while the narrow semantic facts are those facts that are a manifest consequence of the semantic facts.

Putting the previous three distinctions together, the result is that coordination facts are semantic facts in the narrow and status sense. To make this clear, Fine proposes the following terminology:

> "We might talk of semantic "requirements," or of what is semantically "required," when the narrow conception is in question and talk of "semantic facts" when the broad or neutral conception is in question. Thus semantics, as we are conceiving it, is given by a body of semantic requirements rather than semantic facts; and it is in terms of these requirements rather than the facts themselves that the notion of strict coreference is to be understood."
> (Fine 2009: 50)

The notion of a requirement is supposed to indicate that its content is critical for semantic competence. It suggests that a speaker who fails a semantic requirement thereby commits a semantic error[33]. For example, to count as being semantically competent with the proper name "Cicero", it is semantically required that one knows the fact that "Cicero" refers to Cicero, and likewise for "Tully". However, even though it follows from those facts that both terms are co-referential, it is not a semantic requirement that one knows this. Therefore, a failure to know it does not compromise someone's semantic competence. For thought, the notion corresponding to semantic competence is rationality. A failure to realize that two distinct if factually co-referential belief constituents are in fact co-referential does not undermine one's status as a fully rational being.

The upshot is two referential expressions are coordinated if they are strictly co-referential, which they are if it is semantically required that they co-refer. Having explained the positive notion of coordination, a final brief remark on its negative counterpart. What does it mean to negate a claim that two expressions are coordinated? It can effectively mean two things. It can mean either that it is a semantic fact that the two expressions are not coordinated, or that there is no semantic fact of the matter whether they coordinated or not. This results in three distinct negative conceptions of coordination. First, one can say that two expressions are negatively coordinated if it is a semantic fact that they are not coordinated. Secondly, one can say that two expression are not coordinated if there is no semantic fact of the matter as to whether they are coordinated or not. Finally, one can speak of a lack of coordination if there is either negative or no coordination. Fortunately,

[32] For obvious reasons, Fine also speaks of the subjective domain of information and the objective domain of facts (2009: 50). The former takes into account people's limited perspective on or access to the latter.
[33] For thought, the corresponding error is an error of rationality, as mentioned before.

however, for most of the case discussed the distinction between the first and the second option is either unimportant or self-evident. The reason is that Frege's Puzzle is generally concerned with determining the fundamental distinction between a coordinated and an uncoordinated pair of expressions, which can be determined whether the uncoordinated expressions are negatively coordinated or not coordinated. On account of this, the thesis uses the terminology of saying that there is no coordination to speak of the general notion defined here as a lack of coordination.

2.5 Intrinsic and Extrinsic Content

The current proposal makes substantive use of the notions of intrinsic and extrinsic content. They are defined as follows:

> "[L]let us distinguish between the intrinsic (or nonrelational) and the extrinsic (or relational) semantic features of an expression. The intrinsic semantic features of an expression, in contrast to its extrinsic semantic features, do not concern its semantic relationship to other expressions."
> (Fine 2009: 22)

Fine speaks in this passage and elsewhere of intrinsic semantic features (2009: 40, 42) or of intrinsic differences in content (2009: 51-52), but he only mentions the notion of intrinsic content once (2009: 78). This is to say that the notions play a bigger role in the current proposal as in Fine's original, but they are nonetheless in line with Fine's general thinking. The main reason to give them greater significance is their usefulness for discussing the different variants of Frege's Puzzle as well as for comparing the Relationist theory to its main alternatives in the literature.

The basic Relationist idea is that coordination is assigned as a semantic value to pairs of expressions (2009: 39). So just as an object is the semantic value of an individual proper name, a coordination relation is the potential semantic value of a pair of proper names. Hence, for the Relationist, the pair (PHOSPHORUS, PHOSPHORUS) has a semantic value that is different from the pair (PHOSPHORUS, HESPERUS)[34]. The reason is evidently that the names in the first pair are semantically coordinated, which is not the case in the second pair. Another way to say this is that PHOSPHORUS has a different extrinsic content than HESPERUS, based on the fact that it relates differently to PHOSPHORUS in terms of coordination than HESPERUS. In contrast, both singular concepts are said to have the same intrinsic content, which for proper names simply means that they have the same reference.

There are three important points to make about this terminology. First of all, the notion of intrinsic content is co-extensive with reference only for basic referential expressions such as proper names and, arguably, predicates. The reason is that the Relationist also maintains that the two pairs of singular concepts mentioned above differ in intrinsic content, as the coordination relation that holds between the two expressions in the first pair is extrinsic to the individual expressions in the pair but intrinsic to the pair of expressions itself. In that case, intrinsic content is no longer referential content. Secondly, and most importantly, the notion of extrinsic content has to be understood purely as an abstraction. So to say that two co-referential expressions differ in extrinsic content

[34] As is common in the literature these capitalized names refer to singular concepts, which are the equivalents of natural language proper names in the Language of Thought.

is to say nothing more than that the relevant pairs in which they occur differ in intrinsic content, which they do in the sense that they have different semantic values. The first pair has a coordination relation as its semantic value, while the second does not. Crucially, this means that a difference in intrinsic content between two pairs of expressions is never explained by a difference in extrinsic content between the expressions that are contained in the pairs. Hence, the pairs do not differ in intrinsic content because the basic expressions differ in extrinsic content, it is rather that the basic expressions differ in extrinsic content only because, and in the sense that, the pairs differ in intrinsic content. The alternative in this regard would mirror the Fregean approach of explaining the semantic difference between pairs of expressions by means of a difference in the sense between the paired expressions, which is an explanatory approach the Relationist rejects as unviable. The third point concerns an observation Rattan makes regarding the fact that the qualifier "intrinsic" as used in this context is not the opposite of the general notion "relational" as it is generally assumed in metaphysical discussions (Rattan 2009: 1127). The reason is that reference, for instance, is part of the intrinsic content of proper names, but it is arguably relational in the sense that it involves a relation between a referential expression and an extra-linguistic object. So what is meant with "intrinsic" in this context is roughly "intrinsic within the language". While reference is intrinsic to expressions in this sense, as is Fregean sense, coordination is not, as it concerns relations between entities that are part of the language.

Keeping these points in mind, intrinsic and extrinsic content are useful as linguistic variants of coordination. Hence, a theory that includes them gains in clarity if not expressive power. It is especially helpful for the comparison with possible semantic alternatives. An example of this is the Millian or Referentialist view on the content of proper names, which, as Fine explains, has a positive and a negative aspect (2009: 53). The positive aspect states that reference is the content of proper names, while the negative aspect states that there is nothing more to the content of a proper names than its reference. The Semantic Relationist endorses this view if it is a doctrine about intrinsic content, in contrast to the Fregean, who, by positing senses, assumes a difference in intrinsic content as well. Like the Fregean, however, the Relationist rejects the Millian view insofar as it is a doctrine about the content of proper names in general, which encompasses both the intrinsic and the extrinsic dimension of semantic content. For the Relationist, Referentialism is thus correct about the intrinsic content of proper names, which is their content considered individually, but mistaken about their extrinsic content, which is their content if compared to other proper names.

2.6 Five Variants of Frege's Puzzle

The aim in this section is to briefly discuss five fundamental variants of Frege's Puzzle in order to show how Semantic Relationism can address them. The first variant is Frege's classical case that compares an informative with a non-informative identity statement. The second variant is the monadic version of Kripke's Puzzle, which compares two statements that contain only one co-referential proper name each. The third case is Kripke's well-known Paderewski case, which is only briefly discussed here, as it discussed in great detail later on as a Puzzle for the Language of Thought. The fourth variant compares an informative identity statement with its inverted counterpart. Finally, the fifth case is another intricate elaboration of Kripke's case that is due to Soames.

2.6.1 Frege's Classical Case

The classical case consists of two co-referential identity statements that differ in informativeness:

(11) Cicero is Cicero.

(12) Cicero is Tully.

In order to explain this, the Relationist appeals to a difference in content between the two identity statements based on a difference in the semantic relationship between the two proper names they each contain:

> "A semantic difference between the identity sentences only strictly implies a semantic difference between the pairs of names "Cicero", "Cicero" and "Cicero", "Tully" but we may deny that semantic difference between the pairs of names need imply a semantic difference between the names themselves. There may, in other words, be a semantic relationship between "Cicero" and "Cicero" that does not hold between "Cicero" and "Tully," despite the lack of an intrinsic semantic difference between the names themselves."
> (Fine 2009: 51)

As Fine explains, the coordination relation that holds between the two occurrences of the proper name "Cicero" in (11) is, as the semantic value of the pair of name occurrences, part of the content of the identity statement that contains the name pair. As no such relation holds between the names in (12), its semantic content is distinct, despite the fact that there is no intrinsic semantic difference between the individual names "Cicero" and "Tully". That way, the Relationist agrees with the Fregean that the identity statements differ semantically, and explains the semantic difference on the basis of a difference in semantic coordination. As mentioned, the same explanation also accounts for how identity thoughts and beliefs differ in content according to the Relationist.

2.6.2 The Monadic Puzzle

The classical case contains two name occurrences in each of the statements that make up Frege's Puzzle. However, the Puzzle also arises for statements with only one name occurrence (2009: 52):

(13) Cicero is an orator.

(14) Tully is an orator.

In the monadic case, the Relationist can no longer appeal to coordination between the names within a sentence. Hence, it is not immediately obvious how the Relationist should respond. Some commentators have argued for that reason that monadic cases are counter-examples to Semantic Relationism in much the same way that the initial Puzzle is for Referentialism (Ostertag 2009: 348; Sosa 2010: 353)[35]. Thus Sosa:

[35] Textor makes a similar point in his unpublished (2010c).

> "Fine's [...] solution has it that the sentences 'Cicero is an orator' and 'Tully is an orator' (unlike the sentences 'Cicero is Cicero' and 'Cicero is Tully') have the same intrinsic semantics.[However,] the main argument against the traditional Referentialist reaction to Frege's Puzzle was that 'it seems evident' that 'Cicero = Cicero' and 'Cicero = Tully' differ in meaning, indeed that 'the difference is not even of a slight or subtle sort' (35). But it is hard to combine the thought that the difference in meaning between the identity sentences is obvious (neither slight nor subtle) with uncertainty about whether 'Cicero is an orator' and 'Tully is an orator' have the same meaning."
> (Sosa 2010: 353)

Sosa asks how it can be reasonable to maintain that there is an obvious difference in content in the classical identity case, but then to be uncertain about whether there is such a difference in the monadic case as well. Sosa thus suggests that it is not plausible to assume that both monadic statements have the same content, as the Relationist does.

A few observations have to be made in this regard. First of all, on the proposed view it is only thoughts rather than natural language sentences that have semantic content strictly speaking. Hence, while in the case of natural language sentences, both statements will most obviously differ phonetically, if at all, in the case of thought and belief, both statements will most obviously differ syntactically. In other words, the sentences represent distinct beliefs, which is the case even if the proper names happen to be phonetically identical in the sentences that represent the beliefs. The Relationist thus has no problem to account for the fact that the two thoughts, and hence beliefs, are distinct, which is something that arguably contributes substantially to the intuition that their contents differ[36].

Someone like Sosa might counter that the intuition is directly about the content of the two beliefs, however. In that respect, it is important to keep in mind the difference between intrinsic and extrinsic content. On the Relationist proposal, both statement will not differ in intrinsic content, but there will be a difference in extrinsic content. That is to say that there will be a difference in the resulting content if such statements are conjoined with other statements, possibly themselves (2009: 52, 83). That way, the Relationist can account for the difference in intrinsic content between the following obviously different statements:

(15) Cicero is an orator and Cicero is an orator.

(16) Tully is an orator and Cicero is an orator.

As explained already, the difference in extrinsic content between the constituent sentences is not explanatory for the difference in intrinsic content between the conjunctive sentences. In fact, it is the other way around. That does not change the fact, however, that the Relationist can point to a difference in extrinsic content to account for the intuition that there is a difference in content between the constituent sentences.

For Sosa, this response raises a fundamental question as to what the appeal to a difference in extrinsic content amounts to. Why is it that there is coordination between "Cicero" and "Cicero" in

[36] On the current view only thought has semantic content properly speaking, so there is no independent monadic Puzzle for natural language to take into account.

(15) but not between "Cicero" and "Tully" in (16) (Sosa 2010: 356)? As explained earlier, however, it is important to distinguish between three possible questions in this regard. First, what difference in content there is, secondly, how it holds, and thirdly, why it holds, assuming that it holds. The semantic relation of coordination only explains what difference in content there is, if there is one. In contrast, on the current proposal, syntactic symbol identity explains how coordination holds, if it holds. Whenever a cognitive system uses the same mental symbol in a conjunctive belief such as (15), semantic coordination holds. But none of this explains why there is coordination in some cases but not others. That, however, depends on a multitude of non-semantic factors that are not part of the proposed semantic theory and thus not at issue here. Hence, everything someone like Sosa can reasonably ask from a semantic theory is provided. The sentences of the monadic case represent distinct thoughts that differ in extrinsic content, which is explained both in terms of what it means and how such a difference is constituted.

To be sure, there is an important difference with the Fregean here. A Fregean will maintain that there is semantic difference between the statements (13) and (14) because of a difference in sense between the proper names they respectively contain[37]. Accordingly, the Fregean can explain, as part of the semantic theory, why (15) differs semantically from (16). The Relationist cannot provide this type of semantic explanation. For the thoughts, and thus beliefs, corresponding to the sentences, the Relationist can provide a syntactic answer, however, by stating that there is difference in coordination in the conjunctive thoughts because of a difference in the syntactic identity between the proper names in the thoughts conjoined[38].

Even so, the initial intuition concerns a difference in semantic content between statements (13) and (14) that make up the monadic Puzzle. On the Relationist proposal, (13) and (14) represent distinct thoughts, and thus beliefs, which, if considered individually, have the same semantic content. Accordingly, it is reasonable to wonder whether the initial intuition has really been respected. The main response the Relationist offers in this regard is that the intuition is based on the fact that (13) and (14) represent syntactically distinct thoughts that differ in extrinsic content. This effectively means that the intuition about their semantic content is due to the fact that the beliefs are implicitly considered in relation to other beliefs, which is precisely what a difference in extrinsic content captures. Against this, Sosa could object that the appeal to other beliefs underlies only the justification of the intuition, not the intuition itself. Even so, in order to reject a Relationist semantics, Sosa would need to show that the intuition to which he appeals is not already covered by the deliberations mentioned so far. In other words, Sosa would need to show that the intuition about a difference in content is not due to fact that both statements represent distinct thoughts and beliefs, nor to the fact that they have different extrinsic content. Given the highly theoretical notions involved, however, it is highly questionable that a simple appeal to intuition can be enough to substantiate such a claim.

[37] Whether this answer is actually explanatory depends on the version of Fregeanism. If senses are modes of presentations, the answer is explanatory (if highly problematic for the general case), but on Sainsbury's conception of Fregeanism, it is not (and not supposed to be).

[38] Fine maintains that because of the irreducibly relational nature of content, a proper description of content has to consider individual statements as well as their interactions with other statements (2009: 83-84). Accordingly, an interactive model of content has to replace a simple incremental model (2009: 84). On the current view, there is also an interactive model of content, but intrasubjectively, it can be based on an incremental model of syntactic vehicle.

2.6.3 Cross-Coordination

Another case the Relationist has to consider is due to Soames (2010a: 467):

(17) Hesperus is larger than Phosphorus.

(18) Phosphorus is larger than Hesperus.

The problem in these cases is evidently not that there is no coordination relation to apply as in the monadic variant, but that the coordination pattern is the same in both statements. The same issue therefore arises for the following pair:

(19) Hesperus is Hesperus.

(20) Phosphorus is Phosphorus.

Despite the dissimilarity with the monadic case, the same Relationist response is in fact available. In order to distinguish these pairs of statements, the Relationist can appeal to a difference in extrinsic content. As mentioned, this amounts to nothing more than the claim that the following two conjunctions differ in intrinsic content even if the conjoined statements they contain do not:

(21) Hesperus is larger than Phosphorus and Hesperus is larger than Phosphorus.

(22) Phosphorus is larger than Hesperus and Hesperus is larger than Phosphorus.

Accordingly, the theory can take into account that (21) is an uninformative duplication of the initial claim, while (22) is a statement that, in Fregean terminology, can be known a priori to be false. This difference is self-evident. While it is impossible for both statements to be true, since Hesperus is identical to Phosphorus and no object can be larger than itself, one needs to know that Hesperus is Phosphorus to know that (21) cannot be true, which is not the case for (22).

There is an additional difficulty here with regard to the monadic version, however. In the monadic case, the difference between the conjunctions is simply that there is coordination between the proper names in the first sentence, but not the in the second. The additional difficulty here stems from the fact that in both cases there will be coordination between the occurrences of "Hesperus" and "Phosphorus" respectively, and no coordination between the occurrences of "Hesperus" and "Phosphorus". How then can a difference in coordination explain the semantic difference between the two conjunctions (21) and (22)?

There are in fact two ways the Relationist can respond. The Relationist can hold that there is an additional primitive coordination relation that holds between the occurrences of the entire sentence (17) conjoined in (21). As such a coordination fails to hold between (17) and (18) in (22), this accounts for the difference in semantic content between (21) and (22), in analogy to the coordination between proper names in Frege's classical case. This is arguably Fine's proposal in his response to Soames (Fine 2010b). In that case, coordination then has sentences, propositions or thoughts as relata, depending on the underlying approach to language, which, however, are generally complex entities with syntactic structure, and the relation is primitive in the sense that it cannot

be derived from coordination relations that hold between the constituents of these syntactically complex entities.

The alternative preferred in this thesis is to derive the difference in coordination between (21) and (22) from the coordination relations, or a lack thereof, between their basic constituents. To do so, one has to take into account coordination between the syntactic constituents of complex expressions that are not the basic constituents. What the syntactic constituents are in this sense is determined by the syntactic structure of a syntactically complex entity such as a sentence[39]. The constituents in this sense are the syntactically real constituents of a sentence. For instance, the sentence "John likes the apple" has "likes the apple" as a real syntactic constituent, but not "John likes the". The reason is that the former appears in the syntactic derivation on which the semantics operates, but the latter does not.

The motivation for appealing to this intermediate level of representation is that one cannot appeal to the basic constituents in the cross-coordination cases. The reason is evidently that each co-referential proper name occurs twice, and so there is in both cases coordination between the occurrences of the same name and no coordination between the occurrences of the distinct names. Both conjunctive sentences are thus symmetrical in regard to what coordination relations they contain. The relevant difference lies instead in where the coordinated basic constituents appear in the sentence. To accommodate this, it can be maintained that the difference lies in the fact that there is coordination between the pair ("larger than Phosphorus", "larger than Phosphorus") on the one hand, but not between the pair ("larger than Phosphorus", "larger than Hesperus") on the other. These complex expressions are syntactically real constituents of the sentences that contain them, and a difference in coordination between them can account for the difference in coordination between (21) and (22). As a result, (21) and (22) will differ in intrinsic content.

Moreover, the difference in coordination between the phrase constituents is itself explicable by virtue of the difference in coordination between the basic constituents "Phosphorus" and "Hesperus". It is because these basic constituents are not coordinated that the respective phrases are not, and it is because of that that (21) and (22) differ in intrinsic content. That way, one can derive sentential or propositional coordination by appealing ultimately only to coordination between the basic constituents, as long as the analysis proceeds only via the real syntactic constituents a complex syntactic entity has over and above its basic constituents. As mentioned, the appeal to this intermediate level is necessary to break the symmetry in cases of cross-coordination. While (21) and (22) have exactly the same basic constituents, they differ in terms of their non-basic constituents. Hence, the non-basic but real constituents provide the necessary asymmetry to account for the semantic difference between (21) and (22). As a result, a Relationist semantic theory can account for cases of cross-coordination in the same way as for simple monadic cases.

2.6.4 Kripke's Variant

A further case to consider is Kripke's famous example about Paderewski (1979). This section will focus mostly on Kripke's classical version of the Puzzle as discussed by Fine, and consider it only as it applies to beliefs rather than belief ascriptions. Because of some reservations with the examples used by Kripke and Fine, an improved version is proposed later on in the context of the Language

[39] The relevant constituents are the complex expressions to which a node corresponds in the syntactic tree.

of Thought. Even so, a brief discussion of the original case can serve to outline the basic response Semantic Relationism offers to the variants of Frege's Puzzle developed by Kripke.

Kripke's examples all involve subjects who think that a name as used on separate occasions refers to distinct individuals. Fine speaks aptly of a "fractured" use of a name (2009: 90). Kripke's cases in fact have two distinctive features. First, they make use of only one name, so that it is no longer possible to respond to Frege's Puzzle by pointing to the simple fact that the proper names differ, as one might intuitively be tempted to do in the case of the classical example with "Hesperus" and "Phosphorus". More importantly, they raise a fundamental question about the transitivity of notions such as shared or reproduced content (2009: 119).

In Kripke's well-known example, a person called Peter mistakenly thinks that he is introduced to two distinct people called Paderewski when in fact it is one and the same person on both occasions:

> "He may know, for example, that Paderewski is a brilliant pianist (having heard him at a concert) and also that he is a charismatic statesman (having observed him at a political rally), without realizing that it is the same person who is both."
> (Fine 2009: 48)

Assuming for the sake of argument that Peter thinks that all politicians are non-musical, one can suppose that Peter has the following beliefs:

(23) Paderewski (the pianist) is musical.

(24) Paderewski (the politician) is not musical.

From this the following belief seems to follow:

(25) Paderewski both is and is not musical.

Such a belief should not follow, however, as one can imagine that Peter is in fact well trained in logic. Clearly, it would be unreasonably harsh to ascribe such a contradictory belief to Peter, given that he does not know that the pianist and the politician are the same person. Using Fregean terminology, one can say that both uses of the name "Paderewski" are sense-distinct for Peter. As such, they are on a par with an Ancient Greek's uses of "Phosphorus" and "Hesperus", even if the names are phonetically indistinguishable in Peter's case. So far there is thus no real worry for the proponent of a Fregean semantics.

The problem arises once the assumption is added that Peter derives both beliefs from another subject, John, say, who knows that there is only one Paderewski. For instance, John might have the following beliefs, which he communicates successfully to Peter on each occasions where they witness Paderewski together:

(26) Paderewski is a pianist.

(27) Paderewski is a politician.

From these beliefs of John, Peter then derives the following beliefs about the musicality of Paderewski:

(28) Paderewski is a pianist and hence musical.

(29) Paderewski is a politician and hence not musical.

On the standard Fregean view, successful communication requires the transmission of beliefs with the same content, which is to say that the beliefs have to express the same sense or Fregean thought[40]. Because of this, the Fregean has a problem. On the one hand, it is clear that it should be maintained that both of John's uses of the name "Paderewsi" are sense-identical, while Peter's two uses of the name are sense-distinct. This reflects the fact that John knows there is just one Paderewski, while Peter thinks there are two. On the other hand, it is also clear that each of Peter's use of the name is sense-identical to the use of the name by John from which it is derived. This reflects the fact that on both occasions, Peter understood perfectly what John communicated to him about the person called "Paderewski" present on that occasion. Hence, Peter's use of the name "Paderewski" as thepianist has to be sense-identical with John's corresponding use of that name, and likewise for "Paderewski" as the politician. Unfortunately for the Fregean, these requirements are jointly inconsistent. If both Peter's uses of the name are sense-identical with one of John's uses, while all John's uses of the name are sense-identical as well, it follows that all Peter's uses of the name must be sense-identical too. The obvious reason is that sameness of sense is an identity relation and hence transitive. Fine concludes:

> "To account for this phenomenon, we need a notion of "same-saying" or of "reproducing content" that can fail to be transitive. This is something that the relationist can provide in his notion of strictly co-referring or saying the same when the relata between which the relation holds may to some extent be opaque. But it is a mystery what the Fregean might put in its place. If coordination is a matter of having a common sense or "guise" then it must be transitive [...]"
> (Fine 2009: 119)

The crucial difference between Fregeanism and Semantic Relationism is that coordination is not a transitive relation, unlike the sense-identity relation that it replaces. Hence, the Relationist can maintain that both Peter's uses of the name are coordinated with the respective uses of the name by John and that both John's uses are coordinated, and still maintain that both Peter's uses are not coordinated.

What is the reason that coordination is not necessarily a transitive relation? To begin with, it is not an equivalence relation, unlike its Fregean counterpart. The deeper reason is that semantic coordination is based on the notion of a semantic requirement, which is not transitive either, in the following sense. If name_1 is semantically required to be co-referential with name_2, and name_2 is semantically required to be co-referential with name_3, it does not follow that name_1 is semantically required to be co-referential with name_3 as well. Name_3 will of course be co-referential with name_1, but not necessarily as a matter of semantic requirement. In that sense, coordination can fail to be transitive.

Evidently, there is a clear sense in which language users should be able to infer co-referentiality from coordination. If John, say, uses the name "Paderewski" three consecutive times, coordinating each

[40] As will be argued later, many Fregeans in fact reject the requirement of sense-identity as too strong for successful communication, but only to replace it with something that is clearly too weak, such as sameness of reference.

use with the previous one, then he should also realize that the first and the last use are coordinated and hence semantically required to be co-referential. As Fine points out, however, this generally reasonable demand does not apply if a coordination chain is partly opaque to a user (2009: 119). In the example of Peter and John, for instance, the coordination between John's uses of the name is opaque to Peter, and therefore there can be no semantic requirement on Peter to coordinate his uses in the way John does, which in turn entails that he cannot be blamed for failing to realize that both his uses of the name are co-referential. On a Relationist semantics, Peter can therefore not be said to make a semantic mistake by not coordinating his uses of the name "Paderewski"[41]. So unlike the Fregean, the Relationist can maintain the following three claims at once:

(30) Each of Peter's uses of the name "Paderewski" was successfully deduced from one of John's uses by being coordinated with it.

(31) John's two uses of the name are coordinated.

(32) Peter's two uses of the name are not coordinated.

This already highlights that a Relationist semantics can accommodate transitivity failures in a way Fregeanism cannot. Even so, a Fregean might resist the argument by appealing to a broader notion of understanding. There is clearly a sense in which Peter broadly misunderstood what John said, as John spoke of a Paderewski that is both a pianist and a politician, which is not what Peter understood. This defense amounts to the rejection of the Fregean equivalent of (30), which is sufficient to restore transitivity and uphold a Fregean semantics. The obvious question then is which of Peter's two uses can plausibly be said not to have been successfully derived from John. Is it Peter's first or his second use of the name "Paderewski"? This possible Fregean response has in fact been rejected precisely because it raises this question. Taschek, for instance, using "us" instead of an imaginary second person such as John, states:

> "Once it is proposed that 'Paderewski' in Peter's idiolect is ambiguous, the question must immediately arise what the semantic relation is between 'Paderewski' as Peter uses it, and 'Paderewski' as we (who are not subject to Peter's mistake) use it. Are we to say that neither of Peter's two uses of 'Paderewski' can be (homophonically) translated by 'Paderewski' as we use it, or, rather, that one of his two uses can, but not the other? And if the latter is the case, what considerations decide which of his two uses is correctly translatable by our own and which is not?"
> (Taschek 1995b: 291)[42]

This anti-Fregean argument in fact mirrors a point made by Kripke in his original paper:

> "The problem then would be whether Peter's dialect can be translated homophonically into our own. Before he hears of 'Paderewski-the-statesman', it would appear that the answer is affirmative for his (then unambiguous) use of 'Paderewski', since he did not differ from anyone who happens to have heard of Paderewski's musical achievements

[41] Hence, a semantic "ought" implies a semantic "can", and at the same time a semantic "can" implies a semantic "ought". If a user is not in a position to know that two uses of a name are connected via a chain of coordination, there is no sense in which he or she has the semantic obligation to coordinate them, but as soon as this can be known, the uses should be coordinated to avoid committing a semantic mistake.

[42] See also his (1998: 343).

but not of his statesmanship. Similar for his later use of 'Paderewski', if we ignore his earlier use."
(Kripke 1979: 279)

Both arguments attack the idea that there can be a significant asymmetry between Peter's two uses of the name in terms of how they relate to the use of a person with a non-fractured use. The challenge is thus to motivate the idea that one of Peter's uses can be adequately singled out for being sense-distinct. Both Taschek and Kripke suggest that for reasons of symmetry, it is not plausible to argue that one of the name uses was successfully derived but not the other, which renders the envisaged Fregean strategy impossible.

The final part of Kripke's quote, however, which requires the Fregean to ignore the "earlier use", indicates a possible way out for the Fregean. A Fregean will wonder why the earlier use should be ignored in the assessment of the later use. Since there is a clear difference between Peter's uses in the order in which they have been derived, which seems to provide the required asymmetry, why ignore it? Accordingly, a Fregean can single out Peter's second use of the name, maintaining that it was not successfully derived from John's unique use. That way, a Fregean will ascribe perfect understanding to Peter on the first occasion of communication, but insist that the second occasion was in fact a case of misunderstanding. This is plausible enough if one appeals a broader sense of understanding on which Peter misunderstood John in the sense that John was speaking about the same person as on the first occasion, which is not what Peter understood. That, however, yields the required asymmetry, and as a result there is no longer a failure of transitivity for the Fregean to accommodate[43]. It follows that Kripke's case as described by Fine and others is not conclusive against the Fregean. It also follows, however, that if a substantial transitivity failure is possible, only a Relationist semantic theory can accommodate it. Such a case will be presented later in the context of the Language of Thought. Since the problem of the current example is that it allows the Fregean to respond by appealing to a broader notion of understanding, the improved case aims to make this way out impossible for the Fregean.

2.6.5 Soames' Variant

The final case to consider is based on examples from Soames (2010a: especially 473). In his paper, Soames considers mostly belief reports, but the corresponding problems arise also for the beliefs themselves. An example of such a case emerges on the assumption that John in the example above realizes after a while that Peter mistakenly thinks that he, John, is talking about two distinct persons called "Paderewski". As a result, John will acquire the following belief:

(33) Peter believes that Paderewski is not Paderewski.

John, who knows there is only one Paderewski, has the belief that Peter does not believe this. In that case, two conditions have to be imposed. First, both uses of the name "Paderewski" in John's belief have to be coordinated to account for the fact that John knows there is only one Paderewski. Secondly, both uses of the name have to uncoordinated to account for the fact that John does not

[43] This point is repeated later in the context of the Language of Thought, when it is also argued that Fine's example is problematic for the same reason (2009: 119).

believe Peter to be irrational, but only believes him to be mistaken about the fact that there is more than one Paderewski. Both conditions are inconsistent, however. This raises the question how people in fact manage to represent other people as having an fractured use of a name if they themselves have a non-fractured use of that name[44].

An obvious idea is perhaps to suggest that John can "split" his use of the name so as to mirror Peter's fractured use. John would then also have two distinct uses of the name, just as Peter, and the difference between them would be that only John believes an explicit identity statement connecting the two uses. The problem with this proposal, however, is that it implausibly assumes that John's use of a name changes just because one person he knows has a fractured use of it. In other words, why should John extend his language by adding a second name just because one of his acquaintances misidentifies a person on one occasion? Even worse, it is implausible to assume that John henceforth has to choose between one of the uses whenever he thinks or wants to speak about Paderewski[45]. For that reason, Taschek points out, one should avoid a response that requires the extension of the language or basic vocabulary of the believer (Taschek 1998: 346).

The better suggestion is therefore to appeal to complex concepts, rendering the belief as follows:

(34) Peter believes that [Paderewski,1] is not [Paderewski,2]

The crucial point is that the name-number pairs literally represent composite concepts in the Language of Thought of the believer. The complex concepts contain John's singular concept for Paderewski as a constituent, but an additional distinguishing feature as well, represented here by a numeral. Of course, the distinguishing feature need not actually be numerals in the Language of Thought, but importantly, they need not be descriptions either (i.e. "the pianist" vs. "the politician"). For the proposal to work, anything that is present in the available vocabulary that is able to distinguish the two uses is acceptable.

Given that the two initial conditions are contradictory, it is clear that the only option is to impose them on distinct entities. Accordingly, the coordination requirement can be imposed on the singular concept contained within the complex concept to account for the fact that John has no fractured use and knows that Paderewski is the same on both occasions. At the same time, there is a lack of coordination within the scope of the believe predicate between the complex concepts taken as a whole, which accounts for the fact that Peter is not believed to be irrational by John[46]. Moreover, the proposal does not entail that John's language has to be extended in the way Taschek objects against. The reason is that the proposed extension is not of the basic vocabulary, but is an extension of a compositional nature. The composition of a new complex concept out of the existing basic vocabulary is no more an extension of a language than the composition of a thought or sentence is, however. Hence, the proposed solution is able to respect the two conditions while avoiding the

[44] That it is possible is evident from the fact that otherwise people would not even be able to understand Kripke's case. Moreover, the question is particularly pressing if one maintains, as the current proposal does, that coordination is intrasubjectively grounded in sameness of syntactic symbol. The reason is that the first condition requires the symbols used to refer to Paderewski in the scope of the belief predicate to be the same, while the second conditions requires them to be distinct.

[45] And even if this problem can perhaps be avoided on the assumption that John adds two new uses to his vocabulary, this response only exacerbates the initial problem.

[46] In the Language of Thought, the lack of coordination is constituted by the fact that the complex concepts are syntactically distinct (in virtue of the distinguishing feature)

problem raised by Taschek. It follows that cases of the sort raised by Soames can be accommodated on a Relationist semantics[47].

2.7 Semantic Relationism versus Proto-Relationist Views

The aim in this section is to reiterate some important analogies and differences between Semantic Relationism and its Relationist predecessors discussed in the previous chapter. First, a brief comparison with the Fregean approach to semantic theory. In the classical Fregean view espoused by Dummett and others, sense is taken to determine reference in that the sense of an expression provides a "route" to its reference. On this view, understanding a proper name, which is to grasp its sense, entails that a speaker is able to identify the reference via the "route" provided by the sense. As seen, Sainsbury rejects the classical determination of reference in favor of a weaker claim that sameness of sense determines sameness of reference. This means that to understand a proper name, a speaker no longer has to know its reference in a strong sense of knowing. It only requires the speaker to know when two names are used to refer to the same object. That way, a speaker counts as understanding a proper name picked up in conversation as long as he or she understands that it refers to a unique object or person every time it is used. As Sainsbury notes, this view better matches with the weak conditions that people in practice impose on the competence with proper names. Semantic Relationism takes the same approach as Sainsbury's minimal Fregeanism. Coordination also determines sameness of reference as a matter of semantic requirement. This means that properly paying attention to coordination patterns is not primarily a matter of knowing the reference of individual names, but rather about knowing, as a matter of semantic competence, when names are used to refer to the same person. It should be mentioned that the current proposal deviates from Fine in this regard, who upholds a stronger version of determination:

> "it will be possible to read off the reference of an expression from its sense and the uncoordinated content of an expression from its coordinated content"
> (Fine 2009: 58)

The main motivation for this view is arguably that Fine takes coordination relations to hold between occurrences of objects rather than mental representations, about which more in a moment. The upshot, at any rate, is that on Fine's view, the objects referred to by proper names themselves stand in coordination relations. Accordingly, speakers can only know of a coordination relation if they also know about the objects that are the relata of the relation. This is the sense in which Fine claims that one can read off the uncoordinated content of proper names, which are the objects referred by the names, from their coordinated content, which are the same objects occurring as the relata of a coordination relation. Since the current proposal takes a different view on the relata of coordination, this is no longer the case. That way, the current proposal makes it possible that speakers know the coordinated content without knowing the uncoordinated content, which is the case if they know that two proper names refer to the same object as a matter of semantic requirement without knowing which object it actually is. So unlike Fine, the current proposal can

[47] It has already been argued that Taschek's own proposal is unsatisfactory. Kripke did not propose a solution himself, he only developed the problem. The same is true for Soames. Fine does not explicitly consider cases of this sort either, but in personal conversation he approved of the Relationist solution offered on his behalf here.

accommodate the weak conditions actually imposed on the competent use of proper names[48].

A related issue is that for Fine coordination is a factive relation:

> "Since the notion of being a semantic requirement is factive, the relation of strict co-reference is likewise factive; strict co-reference will imply co-reference."
> (Fine 2010c: 497)

The basic idea is that if two proper names are semantically required to be co-referential, they are actually co-referential, which means that they actually refer to the same object. Accordingly, it entails that the names refer to something rather than being empty. That way, Fine adopts the Relationist equivalent of a de re Fregean sense view, on which proper names require a reference to have a sense, based on the idea that senses are de re ways of presenting a reference (McDowell 1984, Evans 1985). As is well-known, however, this leads to the problem that empty names fail to have a sense, which is at odds with the view that understanding a proper name is to grasp its sense on the reasonable assumption that proper names are understandable despite being empty. Fine's proposal has a similar consequence. For that reason, the current proposal follows a different approach on which coordination is not factive in the sense mentioned. As Fine emphasizes, this is a perfectly reasonable Relationist view (2010c: 499). Even so, Fine prefers a different strategy for empty names, assuming that there is a putative rather than a real semantic coordination requirement on empty names (2010c: 497). This alternative again makes sense on Fine's view that coordination relations hold between the actual objects referred to by proper names. If these names are empty, there are no such objects, and hence they can only stand in a putative relation. On the current proposal, that is not the case, however, as mental representations can obviously exists even if there is no object corresponding to them. Accordingly, they are available as relata of a real coordination relation. Whatever the merits of Fine's alternative, an obvious advantage of the current proposal is that it allows for a unified account of coordination for both empty and non-empty names. This respects the intuitive idea that there is no major difference between them in terms of how they are understood, and thus in how they should be treated by the semantic theory.

Another important idea introduced by Sainsbury is the minimal semantic role of senses. Frege takes sense to capture how a reference is presented to the competent user of a proper name. As part of a sense, such a mode of presentation becomes part of the semantics of a language, which means that it has to be known as a matter of semantic competence. Against Frege, Sainsbury argues that what a given sense contains is in fact semantically irrelevant. All that matters from a semantic point of view is that a speaker knows if the sense of two uses of a proper name are the same or not. The Relationist incorporates the same idea:

> "[T]here will be a multitude of senses corresponding to any given referent [...] Coordination does the work, not of sense, but of sameness of sense; and any variation in how sameness of sense might be realized is not something that it can capture."
> (Fine 2009: 60)

[48] It is evidently possible to distinguish here between basic and full semantic competence with a name, where full competence requires that a speaker also know the reference of a proper name. Even so, the issue is not merely terminological. The real question is whether one can count as semantically competent in the use of a proper name even if one does not know who or what it names. Dummett and Fine think the answer is no, while the current proposal accepts Sainsbury's view that the answer is yes.

Importantly, the fact that coordination cannot capture this is an advantage and not a disadvantage of the theory, as it is something that should not be part of the semantics of a language. If the way sense-identity or coordination is realized is included in the semantic theory, it ipso facto becomes a condition on semantic competence, which, however, it is not. The minimal view adopted by Semantic Relationism in this regard, which is in fact built into the theory as a matter of necessity, is thus preferable to classical Fregeanism.

The truth-conditional relevance of a secondary notion of content was also mentioned in the previous chapter. For the Relationist, coordination has no truth-conditional impact:

> "[T]he sense of a sentence is descriptive or truth-conditional in character; it bears upon the conditions under which the sentence is true (and, in general, the sense of an expression will bear upon the conditions under which it has application to the world). But the coordinative aspect of the coordinated content of a sentence, such as "Cicero wrote about Cicero," is entirely lacking in any special descriptive or truth-conditional character and relates entirely to how its truth-conditions (Cicero's suicide) are to be grasped. It is a significant feature of the traditional Fregean view that there can be no difference in what it is to grasp the sense of an expression without there being a difference in how the sense has application to the world. Suppose, for example, that we understand "Hesperus" as the evening star and "Phosphorus" as the morning star. Then this difference in sense corresponds to a difference in what it takes for the sentences "Hesperus is visible" and "Phosphorus is visible" to be true. But under the relational view, these two aspects of sense come completely apart. There is no difference in what it takes for the sentences "Cicero wrote about Cicero" and "Cicero wrote about Tully" to be true, even though there is a difference in their coordinated content."
> (Fine 2009: 59)

It was argued that this is the only plausible view on the truth-conditional impact of the secondary notion of content in view of the fact that a sentence that predicates something of Hesperus is true under exactly the same conditions as a sentence that predicates the same of Phosphorus. It seems self-evident that the truth of, say, "Phosphorus is a planet" is conditional on exactly the same state of affairs as the truth of "Hesperus is planet", given that Phosphorus is the same object as Hesperus. Even so, Sainsbury denies this, without, however, providing a good reason for it. A possible analysis is that Sainsbury is influenced by the classical Fregean view that equates proper names with the descriptions that provide their senses. Evidently, co-denoting descriptions do have different truth-conditional impact. The state of affairs that makes "the star visible in the morning is a planet" true is not the same as the state of affairs that makes "the star visible in the evening is a planet" true. That, however, has no bearing on the truth-conditional impact of proper names unless one thinks proper names have descriptive content, which is not the case for Sainsbury. Any non-descriptivist view on proper names should therefore accept the truth-conditional equivalence of co-referential proper names, and thereby accept that semantics is not a matter of truth-conditions alone. Incidentally, a truth-conditional approach to semantics is another possible motivating factor for Sainsbury, as it requires any difference in meaning to be reflected in a truth-conditional difference.

The Relationist theory also accepts the explanatory modesty endorsed by Sainsbury's minimal Fregean view. On the classical Fregean view, the principle underlying sense identity is that there is

a mode of presentation such that for all instances of sense identity, the latter holds in virtue of the former. Since the views on what senses are or contain differ, this principle can be formulated in the following more general terms. There is something, such that for all cases of sense identity, the latter holds in virtue of the former. The Relationist replaces this with a weaker principle that inverts the order of the existential and the universal quantifier. For all instance of semantic coordination, there is something in virtue of which it holds. The motivation for this weaker principle is that it allows for an explanatory project that is feasible while remaining substantive. On the one hand, the Relationist does not thereby abandon the explanatory project of explaining how semantic facts about coordination obtain in virtue of non-semantic facts. On the other hand, the Relationist is thereby not forced to account for semantic coordination facts on the basis of the same kind of non-semantic facts. That way, not every instance of coordination needs the same kind of explanatory basis. Coordination remains explicable in all cases, but not necessarily by virtue of the same type of explanation. More specifically, this allows the Relationist to make the following claims, which are explained and defended later on. Intrasubjective coordination holds in virtue of the syntactic identity of the underlying mental symbols. Intersubjective coordination, in contrast, never holds in virtue of syntactic facts, but in virtue of facts about linguistic communication. That way, facts about semantic coordination are always explained, but in different ways. Sainsbury, in contrast, does not envisage the possibility of such a weaker explanatory principle, instead dismissing the entire explanatory project. In contrast to what Sainsbury suggests then, the Relationist is able to provide a substantive yet adequately limited and thus feasible explanation about the non-semantic factual basis of the secondary notion of semantic content[49].

A final issue concerns Kripke's point about the importance of baptisms for the semantics of proper names. The underlying idea of the causal-historical theory of reference is that a proper name refers to whoever or whatever was baptized with the first use of that name, where each use of a proper name is connected to its first use by a causal chain of uses. On this view, the meaning of a proper name is thus closely connected to both the act of baptizing and the object baptized. Against this, Sainsbury makes the following observation:

> "However, it is unclear that the relation to the object could do any work: so long as the baptism does invest the name with a meaning, we need only check whether subsequent uses are related appropriately to it in order to determine that they belong to the same name-using practice. The Kripkean referent thus appears to be idle in the account of the unity of a name-using practice [...]"
> (Sainsbury 2002: 212)

Sainsbury's main point is that it is semantically irrelevant whether there is a real object involved in a baptism. Thus, a semantic theory should not build the existence of such an object into the meaning of a proper name. The general point Sainsbury makes can be taken a step further, however. Since for Sainsbury sameness of sense is the primary notion, rather than sense as such, his observation suggests that the initial name introduction is not important either. The crucial semantic role of senses is that sense identity determines sameness of the reference. For this, the actual reference is irrelevant, which means that neither the object baptized nor the baptism itself is semantically relevant. What matters semantically is only the guaranteed transmission of reference from that moment on. Taking this into account, the Relationist incorporates only the coordination

[49] Sainsbury can of course opt for the same principle.

relation into the semantic theory. Speaking figuratively, coordination goes back to the first use of a name, but no further. Any additional circumstances surrounding the introduction of a name are of no semantic relevance, for instance whether the baptism involved an actual object or not.

2.8 Semantic Relationism versus Holism

The aim in this brief section is to make one very important clarification about Semantic Relationism. In view of the great importance Semantic Relationism accords to non-intrinsic semantic features, it is tempting to think that the theory is very similar to holistic semantic theories. However, as Fine states:

> "It is important, if the present doctrine of Semantic Relationism is to be properly understood, that it be distinguished from the more familiar doctrine of semantic Holism." (Fine 2009: 3)

The similarity between Semanitc Relationism and Holism is in fact superficial at best, as there are fundamental differences between them. Semantic Holism can take various forms, the best-known of which are arguably Inferential Role Semantics and Conceptual Role Semantics. For current purposes, the differences between the various forms of Holism are not important, however, as the difference with Semantic Relationism lies in the basic underlying idea they all share, which is that the meaning of expressions fundamentally depends on the meaning of other expressions. In the case of Inferential Role Semantics, the meaning of an expression is taken to be constituted by the role of that expression in inferences. On this view, the meaning of "Superman" is partly constituted by the legitimacy of inferences to, say, an ability to fly. For something to be Superman, it thus has to be able to fly. This is evidently how the proponent of an Inferential Role Semantics responds to Frege's Puzzle. For the Inferentialist, "Superman" differs in content from "Clark Kent" as the latter does not license inferences to an ability to fly[50]. That way, the meaning of "Superman" depends on the meaning of the predicate "to fly". Conceptual Role Semantics appeals to an even broader role of a concept in a person's cognition. This can include the inferential role a concept has in other beliefs, but it can also be the role of the concept in causing behavior. For instance, the conceptual role of "Superman" will be such that it causes a person in danger to approach its reference, which is not so for "Clark Kent"[51].

As Fodor has famously argued, however, if these proposals want to avoid a fully holistic approach, they require a distinction between definitional and non-definitional roles, which amounts to an analytic-synthetic distinction (Fodor and Lepore 1993: 31). The reason is that all definitional inferences will be analytic, while all the non-definitional will be synthetic. It is widely accepted, however, that such a distinction is not viable. The proponents of these semantic theories can thus only avoid this distinction if they accept that all inferences or roles are definitional, which results in a truly holistic semantic theory, on which the meaning of one expression depends on the meaning of all the other expressions with which it is connected.

The major problem for Semantic Holism to is that it renders meaning too unstable precisely because it has to consider all inferences determinative of meaning (Fodor and Lepore 1993). As soon as

[50] More is said about this proposal when considering Frege's Puzzle for the Language of Thought.
[51] This again provides the proponent with a prima facie response to Frege's Puzzle, about which more later.

people no longer believe that Pluto is a planet, for instance, the meaning of "Pluto" changes, as "Pluto" is then no longer the expression that licenses the inference to the predicate "being a planet". This is already a highly questionable result of the theory, but even worse is the fact that implies that people cannot actually change their beliefs about Pluto. The reason is that PLUTO as it appears in the new set of beliefs no longer has the same meaning as PLUTO in the old set of beliefs. There is also a corresponding intersubjective problem. Since the beliefs people hold vary widely, the fact that all the beliefs of a person are determinative of the meaning of the concepts they have entails that the meaning of concepts also varies widely between people. Amongst other things, this has the implausible consequence that people cannot share beliefs unless they share all their beliefs, which is hardly ever the case. The same problem arises for Conceptual Role Semantics. Given the vast differences in behavior displayed by people, the fact that the causal role of a concept is considered determinative of its meaning entails that people cannot share concepts or beliefs. Due to Fodor and others, these and similar concerns are of course well-known, and proponents of holistic theories have tried to develop strategies to address them. It will be argued later, however, that insofar that holistic theories have been proposed to solve Frege's Puzzle for the Language of Thought, they fail. The objective at this point is therefore limited to highlighting how Semantic Relationism differs from holistic semantic theories.

In stark contrast to Semantic Holism, Semantic Relationism takes the content of expressions to be determined by its relation to other occurrences of the very same expression rather than the occurrences of other expressions[52]. To give an example, the Relationist claims that "Clark Kent" differs from "Superman" because "Superman can fly and Clark Kent cannot fly" differs from "Superman can fly and Superman cannot fly", and not because one expression allows for an inference to "can fly", but not the other. The relevant coordination relation holds between both "Superman" occurrences, and it fails to hold between "Superman" and "Clark Kent". Therefore, there is no semantic relationship of importance between "Superman" and "can fly". As a result, the content of a concept is independent of the content of the other concepts with which it is associated in inferences or other beliefs. This is made evident by the fact that "Clark Kent" differs in content from "Superman" even if both would license the inference to "can fly". It would even hold if there was no inference or belief whatsoever to distinguish the two proper names.

As a result, Semantic Relationism faces neither the intrasubjective nor the intersubjective problem. Changes in belief do not affect the content of proper names. If a person switches from the belief that Pluto is a planet to the belief that Pluto is not a planet, the coordination relations remain unaffected. As a result, the new belief still contains a concept with the same semantic content, which allows for the fact that the new belief is a change in belief about Pluto. Similarly, there is no problem with the intersubjective sharing of concepts and beliefs. For coordination across speakers, there is simply no requirement that any or all the beliefs involving the concept are shared. In fact, the view even allows for two speakers to disagree completely in their beliefs about some object. That way, Semantic Relationism avoids the difficulties that undermine Semantic Holism[53].

[52] Both views take into account relations to other expressions, but the crucial point is how to understand this "other". Also, the formulation in terms of other occurrences is the general view proposed by Fine. On the current view, it is rather other token concepts that are constitutive of extrinsic content. The point remains the same, however. Coordination never holds between tokens of different types.

[53] Another difference between the approaches lies in the fact that coordination is not necessarily transitive, while the counterparts in Inferential and Conceptual Role Semantics are, as sameness of role is an identity relation.

2.9 Departing from Fine

The aim in the final part of this chapter is to propose and motivate some changes to Fine's original version of Semantic Relationism. Although some alterations have already been mentioned, for instance about the factivity of coordination, the changes in this section are of a more fundamental nature. All but one of them concern the possible relata of the coordination relation. The questions that the current proposal answers in a different way than Fine are the following. Are the relata of coordination contents or content bearers? Are they occurrences or tokens? Are they complex expressions or only simple, basic expressions? Are they constituents of both language and thought, or only of thought? The final issue has to do with the nature of content and the role of propositions in Semantic Relationism and semantic theory more generally.

2.9.1 Coordinating Content or Expressions

The most fundamental amendment proposed here has to do with the fact that Fine considers Semantic Relationism a version of Referentialism (2009: 5, 37). Hence, Fine's view is that:

> "The need for semantic relationships arises, on the present view, [...] from the desire to account for the straightforwardly representational features of language."
> (Fine 2009: 4)

On Fine's proposed view, coordination is taken to be part of what is represented in much the same way that objects are represented. Put differently, pairs of expressions represent coordination relations in the same way that proper names represent objects. In contrast, the Fregean approach distinguishes between what is represented, captured by the notion of reference, and how it is represented, which is accounted for by the notion of sense as the mode of presentation of a reference. Fine rejects this difference in representational character between the two levels of semantic content, which is what allows Fine to characterize his view as a version of Referentialism. This explains why Fine suggests the following account of coordination in identity statements, such "Cicero is Cicero":

> "The natural way to proceed is to let differences in "coordination" among names show up as differences in coordination among the objects to which they correspond."
> (Fine 2009: 54)

For Fine, the semantic value of a coordinated pair of names is thus a coordination relation between the objects named. Since the same relation does not hold for the pair of names "Cicero" and "Tully", however, it is clear that the putative relation cannot hold between the objects as such, because what relation can possibly hold between Cicero and Cicero that does not hold between Cicero and Tully given that Tully is identical to Cicero?

At this point it is helpful to look into the deeper background of Fine's approach. The roots of the approach lie in Fine's previous work on the basis of syntax, in roughly the following way. Initially, Fine sets out to ground syntax, for which he concludes that he needs what he calls an ontology of occurrences. Later, Fine develops a Relationist semantics based on the same ontology. From this point of view, the semantic proposal thus incurs no additional metaphysical costs, as his previous project of grounding syntax already requires the same ontology. A major motivation for the alternative version of Semantic Relationism offered in this thesis is to abandon Fine's

ontology of occurrences. Accordingly, this means giving up both the Referentialist approach to Semantic Relationism and the project of grounding syntax in what Fine calls a general theory of constituent structure. The reason is that the resulting view is considered more plausible for the area of application of interest to this thesis, but it has to be admitted that the proposed theory is therefore both less basic and less general than Fine's original proposal[54].

Fine's basic view on syntax is set out in his paper "The Problems of De Re Modality" published before his work on Semantic Relationism (2005c). In the paper, Fine seeks to ground linguistic syntactic structure, which he does not consider fundamental, and which ultimately leads him to postulate an "ontology of occurrences" (2005c: 74). The project proceeds as follows. First, a theory called a "universal abstract syntax" has the aim to

> "attemp[t] to formulate the general concepts and principles of syntax, the ones applicable to any possible language, and it attempts to formulate them in the most basic terms."
> (Fine 2005c: 73)

This theory can also be called a "general theory of constituent structure" (2005c: 74). A crucial feature of this general theory is that not only linguistic symbols can have the basic constituent structure underlying syntactic structure, but objects in general[55]. That way, the universal abstract syntax is supposed to be a general "theory of constituent structure", and not just a theory of linguistic structure. Accordingly, Fine rejects the widely adopted approach of deriving syntactic structure on the basis of the primary operation of syntactic symbol concatenation, as on his view the basic theory of constituent structure is supposed to be both more general and more basic than the theory of syntactic concatenation. Fine considers linguistic syntax a specific and derived case of the general theory of constituent structure.

For two reasons, the notion of an occurrence of an object then has to be more basic than that of a syntactic occurrence in a complex linguistic construction. First of all, in order to ground syntactic structure, the notion of an occurrence must be more basic, if else circularity would threaten in that the notion of an occurrence would already presuppose a syntax of some form, even if it is only the most universal abstract one. Hence, Fine's notion of an "occurrence of", which formally is a function from unique objects to its (possibly) non-unique occurrences, is fundamentally a metaphysical and not a linguistic relation. A similar point also holds for the theory of constituent structure. If it is to be defined on the basis of occurrences, occurrences cannot in turn be defined in terms of some structure[56]. Moreover, the notion of an occurrence is one that has to be applicable to objects in general, not only to linguistic entities. Since linguistic or syntactic occurrences are just a subset of occurrences in general, it is plausible to assume that the notion of an occurrence is more basic, so that linguistic occurrences can be defined as a subset of the occurrences in general by virtue of one or more additional criteria, which are presumably itself of a linguistic nature[57].

[54] The thesis defends no views on whether one can or should ground syntax in something more basic, and whether Fine's attempts are successful.

[55] A good motivation for this is the prima facie plausible view that non-linguistic entities can have constituent structure as well. An obvious example mentioned by Fine are facts, which can have for instance objects and properties as constituents. Another plausible candidate are mathematical objects such as sets.

[56] To be more precise, this holds for Fine's basic relation of "being an occurrence of".

[57] Most probably, an occurrence will be linguistic or syntactic occurrence if and only if the objects of which it is an occurrence is itself a linguistic or syntactic object. On such a view, occurrences of concepts would count as linguistic objects, while the occurrences of objects in Russellian propositions would not be, at least not in the general case.

As a result, it must make sense for Fine to say that there are occurrences of objects even without the presence of linguistic structure. Thus, the notion of an occurrence should not be taken to presuppose linguistic structure, as it would be if the notion of an occurrence is defined in terms of the fact that an object occurs twice, say, in a structured proposition. Fine concludes:

> "[W]e must therefore posit an ontology of occurrences of entities, in addition to the entities themselves."
> (Fine 2005c: 74)

Fine arguably carries this conclusion over into his semantic theory. Since occurrences of objects are now available as additional entities distinct from the objects they are occurrences of, it is now possible to assume that there are coordination relations that hold between some of the occurrences of an object, but not others. Hence, it is not the case that the coordination relation holds between Cicero/Tully and itself if the names are coordinated, and not between Cicero/Tully and itself if the names are not coordinated, which would be inconsistent. Rather, coordination holds between some of the occurrences of Cicero/Tully, but not others. The view is then consistent, but hardly plausible metaphysically. It requires an entirely new domain of entities in addition to the domain of actual entities, as Fine admits in the quote above. Moreover, the view also raises non-metaphysical concerns. If coordination holds between the contents of proper names, as Fine claims, and coordination can only hold between the occurrences of objects, it follows that the content of proper names are occurrences of objects, rather than the objects themselves. In other words, the view has the radical and counter-intuitive consequence that proper names do not actually refer to the objects they are proper names of, contrary to what is assumed by both Referentialism and Fregeanism. It also means that if one takes reference to capture what people speak about when using a proper name, people actually speak about entities that are not the entities they intuitively think they are speaking about. For both metaphysical and linguistic reasons, it is therefore preferable to avoid these consequences of Fine's version of Semantic Relationism.

On the current proposal, the underlying mistake is that Fine thinks of representation only in terms of what is represented, neglecting the dimension of how things are represented. With the limited focus on what is represented, it is inevitable that Fine thinks of coordination as something that is represented, rather than taking coordination to be concerned with how things are represented. On Fine's view, coordination is part of what is represented in the same way that objects and properties are. Accordingly, it is Fine's limited view on the nature of representation that leads to the idea that coordination holds between non-linguistic objects, which in turn requires the substantive ontological commitment to occurrences as independent worldly entities.

The alternative approach to Semantic Relationism preferred here is more Fregean in spirit. For a Fregean, reference is a matter of what is represented, while sense, the second level of semantic content, is about how it is represented. A Relationist can similarly think of coordination as being about how things are represented. The difference between the classical Fregean and the Fregean Relationist is that for a Fregean, sense is a matter of how expressions individually present their reference, while for the Relationist coordination is about how expressions represent objects pairwise[58]. In light of this, a better version of Semantic Relationism is thus Fregean in the important

[58] The difference between a coordinated and an uncoordinated pair of names is that the former represents the objects as the same. In the intrasubjective case, a difference in "how" then amounts to either "by means of the same mental symbol" or "by means of a different mental symbol". For intersubjective coordination, the issue is more complex.

respect that it assumes, firstly, that there are two levels of semantic content, and secondly, that one level is about what is represented while the other is about how it is represented. To this extent, the version of Semantic Relationism endorsed in this thesis is closer to Fregeanism than Referentialism, thus vindicating the following observation by Rattan:

> "[...] Semantic Relationism is under a [...] threat of dialectical appropriation, for the Fregean will counter that Semantic Relationism is not an alternative to the Fregean view but an elaboration of it."
> (Rattan 2009: 1126)

Although Rattan is right about what seems to be the best version of Semantic Relationism, he is manifestly mistaken about the original proposal that his comment is about. Moreover, whether Semantic Relationism is a version of Fregeanism or an alternative to it is to some extent a mere terminological matter. If Fregeanism is defined as any semantic theory that posits senses, Semantic Relationism is clearly an alternative. If it is defined instead as any two-tier semantic theory that is based on a fundamental distinction between what is represented and how it is represented, Semantic Relationism is an elaboration of the basic Fregean view. Clearly, nothing substantial depends on this purely terminological issue.

How does the alternative approach suggested here address the initial problem Fine faces? The problem Fine encounters is to say how there can be a difference in coordination between Cicero and Tully given that they are the same object, and his proposed solution is to appeal to relations between occurrences of objects rather than the objects themselves. On the current view, it is much more intuitive to think that the coordination relations hold between objects as represented. Hence, there is coordination between Cicero represented as Cicero twice, but no coordination if Cicero is represented once as Cicero and once as Tully. On this view, it is no longer necessary to appeal to occurrences of objects, as their role will be assumed by representations of objects. This means, however, that one has to acknowledge that semantic coordination is fundamentally concerned with the objects that represent rather than the objects that are represented. That way, coordination is a relation between representations rather than the objects they represent. In addition, coordination is then a matter of how representations represent objects in relation to other representations (that represent the same objects), which is largely independent of what is represented, namely the objects.

The Fregean approach to Semantic Relationism has two main advantages. First of all, it avoids the metaphysical costs associated with the additional realm of occurrences. The alternative makes do with the familiar domains of worldly objects and mental representations, positing which is metaphysically modest and plausible. Secondly, it avoids the consequence that the reference of proper names is not the object itself but only an occurrence of it[59].

[59] It should be mentioned that there is perhaps an alternative way for Fine to achieve the benefits of the Fregean approach. In his (2010d), Fine claims that the mistake in his original proposal is to reify semantic requirements. More is said about this when considering the role of propositions in Fine's account, but the basic idea is that one can have semantic requirements without having coordination relations as objectified correlates. Although the current proposal endorses this idea, it arguably does not change the fundamentally Fregean spirit of Semantic Relationism, as semantic requirements are imposed exclusively on linguistic entities, and not their contents, that is, they are not applicable to the objects these expressions are about. Also, they are fundamentally about how something is represented, and not what. The passage in which Fine makes this observations actually supports this view: "[i]n the [...] requirement-based semantics, there will only be appeal to the uncoordinated proposition and the difference between the two sentences will show up in how the proposition is specified." (2010d: 77).

What is Fine's motivation for his alternative Referentialist approach? As mentioned, there is the fact that the metaphysics it relies on is already in place for Fine, so that it occurs no additional costs for him. There is also the fact that at least initially Fine is motivated by the idea of developing Semantic Relationism as a Referentialist alternative to Fregeanism. In addition, there is also the intuitive idea that a notion of content captures what is represented. For instance, if one states that the belief that Cicero is Cicero is different in content from the belief that Cicero is Tully, it is intuitive to say there is a difference in what is believed, and not just in how it is believed. Hence, one might conclude that differences in coordination are semantically on a par with differences in reference. Arguably, this idea is due to a misunderstanding of an ambiguity, however. In fact, a similar ambiguity exists for the notion of the aboutness of linguistic expressions. In an everyday sense, it pertains to the content of expressions, but in a more specific context of analysis, aboutness is captured by the referential dimension of expressions. This explains why "Hesperus" and "Phosphorus" are about the same object, but why speaking about Hesperus is intuitively still not the same as speaking about Phosphorus. Similarly, the basic intuition regarding the everyday notion of what a belief is about concerns its content, and is therefore not an indication that a difference in that dimension should be considered a referential difference. In short, the intuition concerns the notion of content rather than reference and the proposed view respects this intuition by including coordination into the semantic content, which is what is represented by a belief in the intuitive sense. At any rate, it is important not to give too much weight to everyday intuitions. However, even if one does take them seriously, they do not lend support to Fine's Referentialist approach to Semantic Relationism over the Fregean approach adopted here.

A more important motivation for Fine is that he considers coordination part of the representational content of both thought and language. While in the case of natural language it is possible to think that coordination holds between the proper names in the sentence "Cicero is Cicero", Fine thinks the same strategy is not available in the case of thought:

> "Thoughts do not appear to have the same kind of clear syntax as sentences. This then creates a difficulty if we want to talk of coordination within a thought. For between what do we coordinate?"
> (Fine 2009: 73)

The argument is then as follows. If there is nothing in thought between which coordination can hold, then it evidently has to hold between something else. Since it cannot hold between the objects themselves, for the reasons already explained, it has to hold between their occurrences:

> "What I would like to suggest is that it may still be correct to talk of a thought being of an object in a given occurrence or position in such cases, even though there may be no corresponding constituent of the thought. Thus in the example of the felt identity above, we may distinguish between the first and the second object of the thought (even when the objects are the same) and hence we may sensibly say that it is, or is not, representationally required that the "first" object be the same as the "second" object of the thought."
> (Fine 2009: 73)

It is clear that if one adopts the Language of Thought Hypothesis, this motivation disappears. This also applies for the following consequence:

> "This [lack of adequate constituents in thought] provides, by the way, yet another reason not to think of coordination syntactically in terms of the repeated use of the same symbol. For in the intentional cases, it may be hard to say what the symbol or symbol-surrogate should be taken to be."
> (Fine 2009: 73)

Assuming the Language of Thought Hypothesis, there is evidently no such difficulty. To be sure, if one rejects the hypothesis, as proponents of Connectionism for instance do, Fine's original proposal is perhaps the only possible alternative. Even so, both the metaphysical and linguistic costs of making the alternative approach to Semantic Relationism viable have to be kept in mind. At any rate, the aim here is not to establish the impossibility of Fine's original approach, but rather to argue that there is a plausible alternative to it, especially if one considers the Language of Thought Hypothesis independently plausible. These considerations are also a main motivating factor for the fundamental claim that Semantic Relationism and the Language of Thought Hypothesis are mutually supportive. It shows that assuming the Language of Thought allows for a metaphysically and linguistically more sensible version of Semantic Relationism, while it is later argued that only Semantic Relationism provides a notion of content adequate for the Language of Thought.

Having highlighted the different approach to Semantic Relationism proposed in this thesis, it is important not to overstate the deviation from Fine. Fine himself acknowledges the parallels between his and the Fregean approach (2009: 57). Moreover, the many substantial differences between Relationism and Fregeanism pointed out by Fine remain unchanged[60]. It is also important to bear in mind that the issue is to some extent only a terminological matter. If a semantic theory is Fregean if it has two levels of content, then Semantic Relationism is Fregean even in the version endorsed by Fine. If, on the other hand, positing senses is constitutive of a Fregean semantic theory, even the version endorsed here is not Fregean[61].

2.9.2 Coordinating Occurrences or Tokens

As explained, on the proposed view coordination is a relation that holds between tokens of mental representations rather than occurrences of objects. Besides the issue whether the relata are content bearers or their contents that was addressed in the previous section, this also deviates from Fine in that the relata are tokens rather than occurrences of content bearers. Evidently, on the object-based approach advocated by Fine, there is no viable conception of token objects as distinct from the objects and their occurrences. Since an occurrence-based approach is available on a view that takes the relata of coordination to be mental representations, however, it makes sense to explain why a token based approach is preferable. In addition, a possible Relationist view is that semantic coordination holds between both expressions and their content, so for the purpose of this section, Fine's alternative proposal that is considered here is the idea that coordination holds between

[60] In fact, Fine offers his own comparison between Fregeanism and Semantic Relationism (2009: 57-60). Fine's points are not discussed here, as they are partly obvious, and partly dependent on a particular conception of Fregeanism. For instance, Fine holds that the sense and reference stand in an "external" relation, which is to say that it is contingent that a given sense has a given reference (2009: 58). That may be true for some versions of Fregeanism, but it is not the case on a view with "de re senses", that is, senses that are essentially object-based modes of presentations. Many of the points Fine makes also do not apply to the version of Fregeanism developed by Sainsbury.

[61] It should be noted that outside of this section, the notion "Fregean" is always used in the latter sense, which makes Semantic Relationism an alternative to Fregeanism by stipulation.

occurrences of expressions rather than expression tokens.

First of all, an explanation of what occurrences are, in particular occurrences of linguistic entities like expressions. The notion is intuitively explicable by means of an example, for instance the sentence "John likes John" in which both proper names of John are coordinated (2009: 124). The sentence type "John likes John" consists of the expression type "John" and an inflected form of the expression type "to like". The basic motivation for postulating occurrences of expressions is to distinguish the first instance of the type "John" from the second. Clearly, the type is by itself not enough to do so, since it is unique. It is numerically the same type that appears twice in the sentence type. On the other hand, it is not possible to appeal to two distinct tokens of the type "John" either, because as an abstract type, the sentence does not contain tokens. A token of the sentence type would of course contain two tokens of the name type "John", but the sentence type itself does not. What is needed, therefore, is an abstract notion analogous to tokens, and it is in this sense that one can speak of the first and the second occurrence of the type "John". Accordingly, occurrences of expressions are abstract like types, but unlike types, they are not necessarily unique. There can be many occurrences of a type, just as there can be many tokens of a type.

For the Relationist, the fact that occurrences are abstract but not necessarily unique is crucial. It allows for the view that semantic coordination is a relation that holds between the two distinct occurrences of "John" in the sentence type "John likes John", which is what enables the Relationist to accord a fundamental semantic role to semantic relationships without subscribing to a holistic semantic theory[62].

Despite the importance of the notion of an occurrence of an expression for a Relationist semantic theory, Fine does not define it explicitly. This is due in part to the fact that Fine counts on an intuitive understanding of the notion that is available from examples, and partly because he relies on his previous work on the metaphysical relation "occurrence of". In his previous work, Fine argues that the relation is fundamental and cannot be defined on the basis of more fundamental notions. Since this is true for the notion in general, it is also true for the specific notion of an occurrence of a linguistic entity.

The current proposal, in contrast, considers the notion of an occurrence to be both non-basic and definable. It makes use of Wetzel's idea that occurrences are definable as ordered triples (Wetzel 1993). An occurrence on this view is an ordered triple <n, x, y>, which represents the n-th occurrence of x in y, where x is the expression type the occurrence is an occurrence of and y is the expression type, mostly of higher syntactic complexity, it is an occurrence in. The number n represents the place x occupies in y. The order of the triple is evidently arbitrary in the definition, and so is the ordering imposed on y. What is crucial is that the definition contains three specifications that uniquely identify each occurrence: what expression occurs, in what expression it occurs, and where the former occurs in the latter. To give a concrete example, <2, "John", "John likes John"> uniquely represent the second occurrence of "John" in "John likes John".

The variance between Fine's approach and the version endorsed here is ultimately due to a different explanatory order. Setting aside the issue whether occurrences are definable or fundamental, the key question is what motivation there is to think that coordination is a relation between occurrences of expression types rather than expression tokens. The main incentive for Fine's view that

[62] Semantic Holism effectively posits fundamental semantic relationships between different types of expression

coordination is a relation between occurrences is the widely shared view that semantics is primarily concerned with abstract objects:

> "[...] semantics first operates at the abstract level of types and is then projected downwards to tokens"
> (Fine 2009: 125)

and

> "Consider a token of "Cicero is Cicero", by way of example. Its semantic value, I would like to suggest, should be taken to derive from the semantic value of the corresponding type."
> (Fine 2009: 125)

Excluding expressions such as indexicals, which are not at issue, this view in fact represents conventional wisdom in semantic theory, based on the underlying idea that expression tokens have semantic properties only in virtue of being tokens of a certain type[63]. It is clear, however, that the only way to combine a Relationist semantics with the view that semantics "first operates at the abstract level" is to posit irreducible semantic relationships between the abstract occurrences of expressions, since the types are unique and the tokens lack abstractness (Fine 2009: 125).

What is the motivation for the opposite view that starts with concrete expression tokens? As is explained in more detail later in the context of the Language of Thought, the main reason is the conjecture only semantic content is suitable as a criterion to determine the type-identity of expression tokens. In other words, the view is that the semantic theory is necessary to address the so-called type-identity problem for Language of Thought expression tokens[64]. The problem with a semantic theory that starts at the abstract level of types (or occurrences) is that it presupposes a solution to the type-identity problem for expression tokens, because of which it is itself not available to solve the problem. This eliminates the possibility of type-individuating expressions by their semantic content. If tokens are taken to have semantic content only in virtue of belonging to a given type, then the tokens cannot be assumed to belong to that type in virtue of having that very content. The proposed alternative is therefore to have semantic theory start at the level of tokens, which allows for the idea that only semantic content constitutes an adequate criterion for the type-identity of linguistic expression tokens. On the proposed view, tokens are the primary bearers of semantic content, and they belong to a given type in virtue of the semantic content they have. In accordance with this, expression types are considered abstract objects that represent their tokens as well as the semantic content these have.

While these considerations do not decisively establish the preferability of the token-first approach, the view has two additional beneficial consequences worth mentioning. First of all, it enables

[63] It is an interesting question why this is the conventional view. A possible motivation is the idea that expressions should have their semantic properties essentially, which tokens, as concrete objects, do not. This motivation is not convincing, however. Even if expressions have their semantic properties essentially, tokens also do so as tokens of a given type. Another motivation is perhaps the idea that concrete signs are only tokens if interpreted by a user as belonging to a certain type, but that idea is based on a picture of linguistic reality that is not shared here, as the current proposal assumes that only mental representations have semantic content, and these are not interpreted. For the disagreement between Fine and the current proposal, it is not important how the standard view is motivated.

[64] Importantly, the problem is not unique to the Language of Thought, as it arises for natural language expression tokens as well. On the current proposal, a solution to the type-identity problem for the Language of Thought represents at the same time a solution for the corresponding problem for natural languages, as concept types individuated by their semantic content can in turn be used to individuate natural language expression types.

the notion of an occurrence to be defined linguistically in a plausible way, which captures the intuitive idea of an expression that occurs at a specific place within another expression of higher syntactic complexity. Secondly, it combines nicely with a realist approach to semantic properties and relations, on which these are part of empirical reality as the real properties of, and relations between, concrete mental representation tokens.

The difference between the current proposal and Fine's original is clearly substantive to some extent, namely insofar as it concerns the way the type-identity problem can and should be addressed. On the other hand, it is partly also just a reflection of a difference in primary aim. Whereas Fine seeks to develop the basic tenets of a Relationist Semantics in the most general form possible, the primary aim in this thesis is to make use of the Relationist semantic theory in order to adequately describe part of empirical reality. As a result, it makes sense for Fine to start on an abstract level, but for the concrete application of the semantic theory, it is clearly necessary to identify the objects in empirical reality that are considered the bearers of the properties and relations posited by the semantic theory.

2.9.3 Coordinating Simple or Complex Relata

Assuming, as before, for the sake of argument that coordination holds only between content bearers, a further issue is whether the relata of coordination are only simple expressions or whether they can be syntactically complex expressions as well. The issue was already addressed in the discussion of Soames' variants of Frege's Puzzle, an it can be briefly reiterated here on the basis of following example:

(35) Phosphorus is larger than Hesperus.

(36) Hesperus is larger than Phosphorus.

As explained, both (35) and (36) have the same intrinsic content, but they differ in extrinsic content. For simple expressions like proper names, a difference in extrinsic content amounts to a lack of coordination, as there is between "Phosphorus" and "Hesperus" in both (35) and (36). What, however, does the difference in extrinsic content between (35) and (36) amount to? That there is such as difference is shown by the difference in intrinsic content between the following statements:

(37) Phosphorus is larger than Hesperus and Phosphorus is larger than Hesperus.

(38) Phosphorus is larger than Hesperus and Hesperus is larger than Phosphorus.

In other words, what are the relata of the coordination relation that holds in the case of (37) which fails to hold in (38), and so explains the difference in intrinsic content between them? There are two possible views on the relata. The first view maintains that there can be coordination between entire sentences just as there can be between their basic referential constituents. In the example, the view maintains that coordination holds between the two occurrences of (35) in (37), while it fails to hold between the occurrences of (35) and (36) in (38). That Fine does not exclude this

option is evident from the fact that he allows semantic requirements to be imposed on complex expressions. In fact, he argues that it can partly explain the compositionality of content:

> "It will be a semantic requirement on complex expressions that they be related in a certain way to their immediate constituents [...]"
> (Fine 2009: 126)

On the proposed view, the differences in extrinsic content between complex expressions can thus be explained in much the same way as between simple expressions. The difference between (35) and (36) will have the same explanation as the difference between "Phosphorus" and "Hesperus". Albeit possible, there is something unsatisfactory about this proposal. The reason is that it takes the difference in extrinsic content between complex expressions as a basic fact that the semantic theory can accommodate but not explain. It is obvious, however, that there should be an explanation of the difference in extrinsic content between the complex expressions (35) and (35) on the basis of the difference between "Phosphorus" and "Hesperus". Hence, a semantic theory should be able to explain the difference between the two complex expressions in the usual compositional manner, that is, on the basis of their syntactic structure and the semantic content of their basic constituents.

The reason that (37) and (38) differ is clearly that in (37) the first proper name of the first conjunct is coordinated with the first name of the second conjunct, which is not the case in (38). That, however, is not yet a compositional explanation of the difference between (37) and (38), but merely a different description of what has to be explained. Evidently, it is not possible to simply appeal to a difference in coordination between "Phosphorus" and "Hesperus" to compositionally explain the difference between (37) and (38), as in both cases there is coordination between the "Phosphorus" and the "Hesperus" occurrences respectively, and no coordination from one to the other. Clearly, the explanation also has to factor in where the proper names occur in the complex expression. However, even though the definition of occurrence takes into account where expressions occur, an appeal to occurrences is not enough either, as in both (37) and (38) the first occurrence of each proper name in the first conjunct is coordinated with the first occurrence of the same proper name in the second conjunct.

The problem is evidently the symmetry that exists between (37) and (38) in terms of the basic constituents and how they are coordinated. The most plausible solution to this problem is to take into account not only the basic constituents of a complex expression, but its non-basic constituents as well. The non-basic constituents of complex expressions in this sense are those constituents that are syntactically real without being basic. In this sense, the sentence "John sees a tree" contains "a tree" as a non-basic constituent, but not "sees a". The crucial difference is that "a tree" is a complex expressions that appears in the syntactic derivation of "John sees a tree", while "sees a" does not, as there is no node in the syntactic tree which has "sees a" as its value.

Specifically, then, (35) has the following real constituents: "Phosphorus", "Hesperus", "is larger than" and "is larger than Hesperus"[65]. In contrast, (36) has the following real constituents: "Phosphorus", "Hesperus", "is larger than" and "is larger than Phosphorus". The crucial point is that while (35) and (36) have the same basic constituents, their non-basic constituents are different. As a result, the semantic theory can appeal to a difference in extrinsic content between the two non-basic constituents to account for the overall difference in extrinsic content between (35) and

[65] The syntactic complexity of the predicate is ignored here because it is irrelevant for the point made.

(36), which in turn accounts for the difference in intrinsic content between (37) and (38). Moreover, the difference in extrinsic content between the relevant non-basic constituents can itself be based on a difference in extrinsic content between one of their basic constituents, namely "Hesperus" and "Phosphorus" respectively. That way, the extrinsic difference in content between the two basic constituents "Hesperus" and "Phosphorus" can explain, in a compositional manner, the difference in extrinsic content between (35) and (36), as required to account for the difference in intrinsic content between (37) and (38) as well.

The upshot is that there is no need to envisage coordination relations with complex expressions as relata. Accordingly, speaking of sentences or thoughts being coordinated can be considered a manner of speaking that is ultimately explicable on the basis of coordination that holds exclusively between basic expressions. In that regard, saying that "Hesperus is Phosphorus" is coordinated with "Hesperus is Phosphorus" but not with "Phosphorus is Hesperus" is analogous to saying that "John sees a tree" refers to John, which is true because the sentence contains a constituent that refers to John and not because it refers to John as a whole, in addition to one of its constituents. Coordination relations with complex relata are thus theoretically dispensable. It should be noted that this explanation does not undermine the principle of compositionality according to which the content of a complex expression is a function of its syntactic structure and the content of its basic constituents. The reason is that the content of the non-basic constituents is also functionally determined by the same syntactic structure and the content of the same basic constituents. The explanation merely highlights the fact that the content of complex expressions is compositionally determined via the content of its non-basic constituents.

To what extent this approach diverges from Fine's original theory is not obvious. Fine speaks of coordination relations that hold between propositions, which are clearly syntactically complex entities, but on closer inspection he always seems to refer to coordination relations between their basic constituents (2010b: 479). This shows that Fine can accept coordination between complex relata as a manner of speaking in the way suggested above. At any rate, the most important issue here is to clarify the current proposal in this respect.

2.9.4 Coordination in Thought

A further disagreement concerns the representational system to which the relata of coordination belong. For Fine, coordination relations can hold within language (2009: 33), within thought (2009: 66), or between language and thought (2009: 86). Hence, for Fine the possible relata of a coordination relation are either two natural language expressions, two constituents of thought, or one of each of those. On the understanding of Semantic Relationism adopted in this thesis, there is strictly speaking only one representational system, which is thought. There is evidently a sense in which natural languages are representational as well, but that is a derivative sense. This means that natural languages are only representational via the thoughts with which they are associated, and which are inherently representational. To give a concrete example, the thought that John is happy inherently represents the world as being such that John is happy, while the English sentence "John is happy" only does so in virtue of the thought it expresses. In other words, only thoughts have semantic content strictly speaking, which means that only the constituents of thought stand in referential relations to extra-linguistic objects and represent the relata of coordination relations.

An important consequence of the view that coordination exists only for thought is that it can make sense of the connection between the semantics of coordination and the underlying syntax. More specifically, it is possible to account for intrasubjective coordination on the basis of syntactic symbol identity, by virtue of the principle that the use of the same mental symbol is intrasubjectively both necessary and sufficient for semantic coordination. This option is available in the case of thought because it avoids the general difficulty Fine raises for this idea (2009: 41). Fine maintains that one cannot think of coordination as a matter of syntax or logical form. The underlying idea of such a proposal is to explain the obvious truth of an identity sentence such as "Aristotle is Aristotle" by claiming that it has the the logical form "a = a", while its informative counterpart has the logical form "a = b" instead[66]. That way, the proposal seeks to solve Frege's Puzzle by appealing to the logical form of sentences, as determined by their syntax rather than their semantics. The reason Fine objects to this is that it has to be explained why the logical form is either "a = a" or "a = b" in each case. Evidently, one cannot appeal to the fact that the same name is used, as shown by the fact that even if with the same name, a sentence can either informatively state the identity of a philosopher with a shipping magnate or non-informatively state the identity of a philosopher or shipping magnate with himself. Fine therefore argues that even if a solution to the Puzzle adduces logical form, it still has to appeal to coordination to justify a given logical form. That way, coordination is necessary even if an approach appeals to logical form to solve the Puzzle.

This argument works only in the case of natural language, however. The reason is that natural languages contain ambiguities that do not exist in thought. In a natural language such as English, a typographically and phonologically identical name can be the name of different people, which is why sameness of name is not enough to ensure a logical form of the type "a = a". That, in turn, justifies Fine's claim that coordination is required. The crucial difference with the same proposal for thought is that the Language of Thought contains no ambiguous symbols. Plausibly, a cognitive system uses different mental symbols for different people, even if they happen to share a name in natural language. As a result, it is no longer necessary to appeal to coordination to justify a given logical form. Contrary to Fine's conclusion for natural languages, it is thus possible to assume that for the Language of Thought, syntactic considerations alone are sufficient to justify a logical form, without the appeal to semantic coordination. As a result, syntactic symbol identity can in turn be invoked to explain when and why intrasubjective coordination holds.

Even so, the explanatory project that premises coordination on syntactic symbol identity is not supposed to be reductive. The suggestion at this point is not to reduce coordination to syntactic symbol identity. The primary reason is that the proposal only applies to intrasubjective coordination, that is, coordination between mental representations that belong to the same mind. However, there is also intersubjective coordination, that is, coordination between the mental representations of distinct minds. In the case of intersubjective coordination, the use of the same mental symbol is neither sufficient nor necessary for coordination, which already entails that the semantic relation of coordination has a different extension than the relation of syntactic symbol identity, and so cannot be reduced to it[67]. Moreover, the proposal is not supposed to be reductive even in the case of intrasubjective coordination. The main reason is that it is plausible to assume that an informative

[66] The informative identity with logical form "a = b" would for example express the false identity between the philosopher Aristotle and the shipping magnate Aristotle.

[67] This is also the reason why the reductive account proposed by Fodor to solve the type-identity problem for Language of Thought symbol tokens ultimately fails. More about this later.

and an uninformative identity thought differ in representational content, and not just in representational vehicle. Semantic coordination is therefore necessary to explain how the respective identity thoughts differ in content. The suggestion is rather that in cases of intrasubjective coordination, a semantic coordination relation is functionally determined by a syntactic identity relation, in much the same way that syntactic structure generally determines semantic content, for instance in the case of the two possible readings of "John saw the man with the binoculars".

What is the motivation for the view that semantic theory applies only to thought? There are in fact many reasons for this approach, having to do with the plausibility of the Language of Thought hypothesis and its role in explaining linguistic competence, which are up for discussion in the following chapters. There are also reasons within the semantic theory for the proposed view, however. Specifically, the option of grounding semantic coordination in syntactic symbol identity makes it possible to explain certain important features of coordination in terms of transitivity and negation that are otherwise left unexplained. As mentioned occasionally, a crucial feature of Semantic Relationism is that coordination is not necessarily transitive. Fine explains that coordination can fail to be transitive "when the relata between which the relation holds may to some extent be opaque", but he is not more exact than that (2009: 119). The exclusive application of semantic theory to thought allows for a very specific and precise account of when and why coordination is transitive.

The general idea is that intrasubjective coordination is always transitive, but intersubjective coordination is not. Why assume this? The basic reason is that transitivity has to be given up as a general feature of coordination due to Kripke's examples, but at the same time the theory should not allow for intrasubjective transitivity failures, if else such failures would no longer count as defective. If transitivity could fail even for intrasubjective coordination, it could be sound for a person to believe, say, that b is F and that if b is F then b is also G, and still reject the belief that there is something which is both F and G. The reason is that he could be unsure whether the b that is believed to be F is the same as the b believed to be G. This is evidently not an example of sound reasoning, however, and yet it should not be defective if coordination could fail to be transitive in intrasubjective cases. The reason is that it could be possible for the "b" in "b is F" to be coordinated with the first "b" in "if b is F then b is also G", which would in turn be coordinated with the second "b", and yet this second "b" could fail to be coordinated with the "b" in "b is F". In that case, the unwillingness to draw the conclusion that there is something which is both F and G would be rationally justified. Since reasoning of this sort has to be excluded as defective, however, the theory has to uphold the idea that intrasubjective coordination is always transitive.

This raises the question whether it can be explained why intrasubjective coordination cannot fail to be transitive. Since transitivity is no longer a general feature of coordination, how explain the fact that it nonetheless holds in all cases of intrasubjective coordination? In Fine's terminology, the reason is that relata of the intrasubjective coordination relation do not have the necessary opaqueness to allow for failures of transitivity. The deeper explanation on the proposed view, however, is that intrasubjective coordination is determined by syntactic symbol identity, which as an equivalence relation is necessarily transitive. This explains why it cannot fail to be transitive, as it is determined by a relation that is necessarily transitive. Conversely, because intersubjective coordination is not so determined, this explains why it is not necessarily transitive. While this idea does not propose anything that deviates from Fine, it adds a specific and well-founded explanation of when and why coordination is transitive and when and why it can fail to be.

A similar result that speaks in favor of proposed approach concerns the negation of coordination. It was explained that there are in fact two ways coordination can be negated. There can either be a fact of the matter that two linguistic expressions are not coordinated, or there can be no fact of the matter whether they are coordinated or not. Later on, it will be argued that this is in fact of crucial importance for the infamous Twin Cases, as it allows the Relationist a radically different take on the problem (Putnam 1973). Roughly, the difference is that a Fregean has to accept that the senses expressed by the concepts of a subject and his twin are determinately the same or not. In contrast, Relationist can allow for indeterminacy in such cases, maintaining that there is no fact of the matter whether the concepts of the subject and his twin are coordinated[68]. The justification for this approach is that intersubjective coordination is determined by facts about communication. Since there is no communication between a subject and his twin in the cases as they are usually described, there will be no semantic fact as to whether their concepts are coordinated, which, crucially, is different from the claim that they are negatively coordinated. Accordingly, it will be indeterminate for the Relationist whether twin subjects represent some object as the same or not.

Just as with transitivity, the indeterminacy should not be an option in the case of intrasubjective coordination, however. It should always be determinate whether an individual person represents something as the same or not. How could there possibly be no fact of the matter whether a subject represents something as the same or not[69]? The same question thus arises as in the case of transitivity. Since indeterminacy is possible for coordination in general, how can it be explained that it is not possible in the case of intrasubjective coordination? The determination of intrasubjective coordination by the syntactic symbol identity relation in thought again provides the required answer. Since the two symbols a cognitive system uses to represent an object are determinately either the same or not, it will always be determinate whether two symbols are intrasubjectively coordinated or not. As a result, concepts are intrasubjectively always positively or negatively coordinated, without third alternative. Since intersubjective coordination is not determined by syntactic identity, the same is not true for intersubjective coordination. Whenever two subjects represent something without any communicative link between them, there are no facts to determine whether their representations are coordinated or not. Evidently, it is always determinate whether they use the same mental symbol or not in the physical sense, but since syntactic symbol identity is neither necessary nor sufficient for intersubjective coordination, this has no semantic import. Hence, just as transitivity failures, indeterminacy is only possible for intersubjective coordination, and that is explained by the fact that, unlike intrasubjective coordination, it is not determined by the syntactic identity of the underlying symbols.

In addition to these considerable explanatory advantages, some further reasons have already been mentioned for preferring a view on which only thought has semantic content strictly speaking. For instance, by enabling the grounding of intrasubjective coordination in syntactic symbol identity, one can explain how a cognitive system can keep track of intrasubjective coordination relations in way that is both plausible and readily understandable[70]. Before considering the role of propositions in

[68] Importantly, this claim is not epistemological but metaphysical.

[69] The claim is of course not that a subject cannot be uncertain about this due to performance errors. The point is again metaphysical, not epistemological.

[70] A possibility raised by Pryor in personal conversation is that it might be possible for a cognitive system to use the same symbol for different purposes, for example in different modules. This is both plausible and contrary to the stated principle of how intrasubjective coordination is determined. If symbols are used in multiple ways, then the identity of syntactic symbol is sufficient only within such a restricted domain. This option is ignored here, for two

the next section, a brief clarification is in order. Even if intersubjective coordination is not grounded in syntactic facts but in facts about communication, the view remains that it holds exclusively between mental representations, and not between mental representations and the natural language expressions used in communication, as Fine maintains. On the proposed view, natural language expressions figure in the communicative facts that determine intersubjective coordination facts, but they are not themselves part of the semantic facts about coordination.

2.9.5 Without Classical Propositions

A final issue where the proposed conception of Semantic Relationism is at variance with Fine is the status and nature of propositions. Fine subscribes to the classical Russellian view of propositions as structured entities that are the contents of sentential expressions. As these contents, they contain everyday objects as constituents. So the sentence "John is happy" has as its content the proposition that John is happy, which contains both John and the property of being happy as constituents. In contrast to Fine, the current view is based on the idea that classical propositions are predicated on the ascription of syntactic and even semantic properties to non-linguistic entities. This general worry is put as follows by Millikan:

> "What seems to be yearned for in the notion that I must know which object my thought is about is a sort of confrontation of thought, on the one side, with the object bare, on the other, taking place, per impossible, within thought itself. Indeed, Russell's view is that exactly this sort of confrontation is possible - the object bare is part of the thought. But, despite contemporary hyperbole that speaks of thoughts that require real objects in order to be thoughts as 'Russellian thoughts', no thought actually consists in part of its object [...]."
> (Millikan 2011: 140)[71]

The main issue is that in the proposition that John is happy, John and the property of being happy are conjoined in the same way that "John" and "is happy" are in the sentence that expresses the proposition. Since the composition of linguistic entities such as "John" is accounted for on the basis of their syntactic properties, the worry is that something similar must hold for John in the proposition as well. Hence, the assumption has to be that John himself has syntactic properties that are similar to those of his name. The reason is the Russellian conception of propositions, on which propositions have syntactic structure but objects as constituents. Fregeans, in contrast, avoid this problem, as they do not envisage a similarly direct "confrontation" between non-linguistic objects and linguistic properties. On their view, the contents of sentences are Fregean thoughts, and they contain senses as constituents, which are not the actual objects but modes of presentation of them. Unfortunately, however, the Relationist cannot opt for a Fregean approach to propositions, as the theory rejects the notion of sense as explanatorily inadequate. Accordingly, the proposal in this thesis to avoid a Russellian conception of propositions on a Relationist semantics is to adopt a view on which propositions are content bearers rather than contents. More specifically, propositions are considered Language of Thought sentences rather than the content these have or express.

reasons. First, it is reasonable to assume that all the expressible beliefs, which are at issue here, are within one cognitively accessible domain. Secondly, the principles and ideas presented in this thesis are readily reformulated to take the necessary restriction to individual modules into account.

[71] Quoted from (Millikan 1993:96).

Although the view is explicated in great detail in an independent chapter, one motivation for it can be briefly outlined here. It is based on an important observation Fine makes about how truth and falsity are understood in Frege's semantic theory, on the basis of a referential relation between sentences and truth-values:

> "[I]t might well be thought, pace Frege, that the semantic relationship between a name and its bearer is different from the semantic relationship between a sentence and its truth-value, that whereas a name names its bearer, a sentence does not name but has its truth-value."
> (Fine 2010d: 72)

Fine rejects Frege's conception of truth as an objectified value to which sentences refer. For Fine, truth is intuitively not an object to which sentences refer in the way that proper names refer to extra-linguistic objects. Instead, he argues that one should think of the truth of a sentence as a property of that sentence, and not as a relation between a sentence and a special kind of object, the True:

> "The semantics will be taken to be concerned with a semantic feature of sentences, their being true or false, rather than with a semantic relationship between a sentence and its value, True or False."
> (Fine 2010d: 73)

The basic motivation for this alternative conception is essentially not a theoretical one. From a theoretical point of view, it makes no difference whether one thinks of truth as a property of sentences or as an object to which sentences stand in referential relation. On the face of it, statements about truth in one framework can easily be reformulated into statements about truth in the other. The crucial issue is rather what the intuitively correct conception of truth is, which the semantic theory should incorporate. If truth is intuitively a property, the semantic theory should not consider it an object. The point against Frege then is that on what Fine calls a value-based approach, the semantic theory does not provide an adequate characterization of the semantic property of truth. An adequate semantic theory should not reify the property of sentential truth.

Fine in fact uses this idea to avoid the questionable ontology of occurrences that appears in his original presentation of Semantic Relationism. The basic idea is to assume that coordination no longer requires an external correlate, so that it no longer stands for some relation between occurrences of objects. Just as truth need not consist in a relation between a sentence and a reified truth-value, semantically required co-reference need not consist in a relation between a pair of expressions and a relation between occurrences of objects. Instead, the semantic theory can be based on semantic requirements without ascribing an objectified value to them:

> "in the underlying requirement-based semantics, there will only be appeal to the uncoordinated proposition and the difference between [co-referential] sentences will show up in how the proposition is specified."
> (Fine 2010d: 73)

As a result of this, the requirement-based semantics no longer needs a metaphysical background theory on which Russellian propositions contain occurrences of objects as distinct entities from the objects themselves. Instead, simple Russellian propositions with normal objects as constituents are

sufficient. Fine analyses the underlying mistake that leads to the metaphysics of occurrences as the commitment to a value-based semantic theory, which forces mistaken conceptual choices:

> "[T]he value-based semantics can be seen to arise from the attempt to reify certain semantic features of the expressions in question. The value-based semantics does not allow us to talk of the semantic features of an expression except in so far as these consist in the expression standing in a semantic relationship to an appropriate semantic value and so, when the features are not directly of this form, they must somehow be encoded as features that are. Thus instead of taking sentences to be true or false, we say that they designate the truth-values True and False; [...] and instead of taking 'Cicero = Cicero' to designate an identity proposition in which the individuals in subject- and object-position are the same, we say that it designates a coordinated identity proposition."
> (Fine 2010d: 75)

While the motivation for Fine's view is limited, his general conclusion is not:

> "In each of these cases, the value-based model does not provide us with the most appropriate way to formulate the semantics. It looks as if the semantics is designative, but what we have are pseudo semantic values and a pseudo semantic relation."
> (Fine 2010d: 75)

HoOwever, given the general nature of the conclusion, the following question arises. If the value-based approach ought to be avoided for both truth and coordination, why not for semantic content in general? Why should one not think of semantic content as a property of complex expressions, rather than conceiving of it as a relation between a sentence and a reified content that is a Russellian proposition[72]? In contrast to Fine, the thesis provides the same answer to this question as Fine does for truth and coordination. Hence, it rejects the classical conception of propositions as structured content entities. The proposal is that just as one should not consider truth a relation between a sentence and a truth-value object, but a property of a sentence, one should not consider content a relation between a sentence and a content entity, but a property of a sentence. The suggestion is thus to relieve Semantic Relationism of the commitment to the ontology of occurrences as well as to classical propositions[73].

The final chapter in this thesis aims to show that it is both possible and sensible to give up the classical conception of propositions in favor of the view that content is a property and propositions are content bearers. This section on the role of propositions can be concluded by pointing out an interesting analogy in this respect. Fine argues that a Fregean value-based approach is awkward in that it requires compositionality for both sense and reference, precisely because it treats sense as an entity:

> "Another [...] interesting, example of the [problem with the value-based approach] concerns the parallelism of sense and reference within the framework of Fregean semantics.

[72] To be clear, coordination is still a relation on the alternative view, and so is the referential relation. The idea is that a sentence having a certain content is a property of that sentence, which can evidently be based on its having the property that two of its constituents are coordinated, or on its having the property that one of its constituents refers to an extra-linguistic object.

[73] In personal conversation, Fine expresses tentative support for the idea of abandoning classical propositions. A further motivation Fine mentions in favor of it is the fact that on the classical view, propositions appear to be entities that themselves stand in need of interpretation, which leads to a vicious circle.

> It is something of an embarrassment that the Fregean framework provides for the compositional determination of both sense and reference."
> (Fine 2010d: 72)

Fine's requirement-based Relationist semantic theory avoids this embarrassment, as there is no longer a "duality of semantic value" for which compositionality is required (2010d: 73). It seems as though there is an analogous embarrassment in Fine's proposal, however. The reason is that it upholds the value-based approach to content, because of which it requires the reduplication of syntactic structure: once for the linguistic bearer to explain why it expresses the proposition it does, and once for the corresponding proposition itself. Accordingly, just as Fine's requirement-based approach aims to avoid the embarrassment of double compositional determination in Frege's approach, the aim in the current proposal is to avoid the analogous embarrassment of double syntactic structure determination that remains in Fine's approach.

Chapter 3

The Language of Thought Hypothesis

3.1 Introductory Remarks

The main aim of this chapter is to outline the Language of Thought hypothesis. For this purpose, the chapter first presents the main tenets of the Language of Thought hypothesis in reference to its main proponent, Fodor, and then indicates how the hypothesis is embedded into the broader representational and computational theory of the mind. After that, two important clarifications are added. The first clarification, described in the second section, pertains to the way the hypothesis is understood in the thesis as opposed to Fodor. The second clarification in the following section is about the scope of the hypothesis adopted. Specifically, the main point is that the Language of Thought is adopted in the thesis as a hypothesis for mental processes only to the extent that these processes account for linguistic understanding and communication. The current proposal is thus not predicated on the correctness of the Language of Thought hypothesis beyond this limited scope[1]. The next section then presents Frege's Puzzle as it arises for the Language of Thought in the form of the type-identity problem, which is the problem of determining when and why Language of Thought expression tokens belong to the same type. This connects the hypothesis to the preceding considerations about the adequate conception of semantic content in view of Frege's Puzzle. The chapter finishes with a discussion of Connectionism, which is widely considered the main competitor of the Language of Thought hypothesis to explain linguistic competence.

The overall objective of this thesis is evidently not to establish conclusively that the Language of Thought hypothesis is true. The very possibility of doing so is excluded by the fact that the nature of mental processes underlying linguistic competence is ultimately an empirical question. Instead, the aim is to contribute to the overall plausibility of the hypothesis by removing a major obstacle to its truth. The Language of Thought is affected by Frege's Puzzle in the form of the type-identity problem, and no semantic theory proposed so far has been adequate to successfully address this problem, nor has there been a convincing argument to show that the problem can be solved another way[2]. Yet Fodor himself as conceded that the entire project "collapses" unless a solution to the

[1] Fodor also acknowledges a limitation in scope for his hypothesis, but he sets a limit at those mental domains where he has good arguments to suppose that the hypothesis is no longer plausible or useful. In contrast, the scope limitation proposed here is primarily due to a limited interest, as the thesis is not concerned with the potential of the hypothesis to explain, say, perception, which means that it is neutral about the viability of hypothesis for domains beyond linguistic competence.

[2] The fact that the type-identity problem is a version of Frege's Puzzle in fact helps to explain why this is the case. If

type-identity problem can be provided (Pessin 1995: 33). The main argument of this thesis with regard to the Language of Thought is therefore that a Relationist semantics has to be adopted as its theory of content. Doing so restores the viability of the Language of Thought hypothesis, and so provides, together with the reasons that call into question the connectionist alternative, a solid if far from conclusive case in favor of the Language of Thought hypothesis for the explanation of linguistic competence. First, however, the goal is to describe the Language of Thought hypothesis and the major problem that threatens to undermine it.

3.2 Fodor and the Language of Thought

This section presents Fodor's major contribution to the philosophy of mind and language by outlining the Language of Thought hypothesis and its connection to the representational and computational theory of the mind. The aim is to describe the general idea and to specify the main reasons that motivate it. The basic idea of the Language of Thought hypothesis is that some mental processes are best understood as being based on mental representations in a language-like medium, the Language of Thought:

> "This language consists of a system of representations that is physically realized in the brain of thinkers and has a combinatorial syntax (and semantics) such that operations on representations are causally sensitive only to the syntactic properties of representations."
> (Aydede 2010)

In Fodor's words, the basic idea is to

> "tak[e] mental states to be relations to mental representations, and [add a] view about what mental representations are like: not pictures, or maps, but formulas in a language-like medium that functions both to express the intentional content of mental states and to provide the domain of mental processes."
> (Fodor 2008: 8)

Hence, the Language of Thought hypothesis is fundamentally a claim about how the mind works, that is, about how it does what is taken to be its main task, namely thinking (Fodor 2008: 8). The basic claim is that thinking consists in the execution of mental computations on mental objects in a language-like system that represent state of affairs outside of the mind. Put differently, the mental process of thinking consists in the exercise of computational capacities on symbolic strings with semantic content. That way, the Language of Thought hypothesis is supplemented by two additional claims. First, the view that the mind is a representational system, the so-called representational theory of mind (RTM), and secondly, the view that mental processes are computational processes, the so-called computational theory of mind (CTM).

The representational theory of mind captures the intuitive idea that the mental states represent mind-external states of affairs. These mental states are therefore relational in the sense that representation essentially consists in a relation between a representing mind and the represented

a non-semantic solution to Frege's Puzzle is generally unsatisfactory, then the same will be true for the type-identity problem for the Language of Thought as well.

things outside of the mind, like objects and properties. However, although Fodor explicitly claims that mental states are "relational states", this does not, at least not immediately, involve non-mental relata for Fodor (2008: 18):

> "RTM is a claim about the metaphysics of cognitive mental states and processes: Tokens of cognitive mental states are tokens of relations between creatures and their mental representations."
> (Fodor 2008: 5)

The crucial point is that what makes mental states relational at first is not a relation to something outside of the mind, but a relation to mind-internal representations. Even so, Fodor's representational theory of mind also intends to capture the relational nature of the mind in the more intuitive sense, in which it captures its representational nature. The reason is that the mental representations to which mental states are relations stand themselves in meaningful relations to mind-external objects:

> "[A]ccording to RTM, Mentalese singular terms, predicates, and the like refer to things in the world and [...] expressions of Mentalese are the representations over which mental processes are defined."
> (Fodor 2008: 93)

The result is the following:

> "RTM defines [...] intentional mental states as relations to mental representations, and explains the intentionality of the former in terms of the semantic properties of the latter."
> (Pitt 2008)

Hence, for Fodor mental states are relational states primarily because they involve relations to mental representations, but they are also relational by involving relations to mind-external objects, in which minds stand via mental representations. Hence, mental states involve relations to mind-external objects by virtue of the fact that they are relations to mental representations which in turn stand in meaningful relations to mind-external objects.

For current purposes, the important idea is that according to the representational theory of mind, the mind is a representational system with a substantial connection to mind-external reality. The Language of Thought hypothesis adds to this the view that these mental representations are organized into a system with syntactic structure. As these mental representations belong to a language-like representational system, it is possible to ascribe to them semantic content, so that the connections in which they stand with mind-external objects can be understood as semantic "word"-to-world relations. Hence, it is because mental representations are taken to have a syntax that they can be taken to have a semantics, which allows for the view that the semantic content of the mind's representational system accounts for the representational or intentional nature of the mind. As explained by Pitt, the resulting view is that the mind is capable of representing things outside of the mind in virtue of the semantic content of its mental representations[3].

[3] It is assumed here that having syntactic properties is necessary if not sufficient for an entity to have semantic properties, which is to be semantically evaluable. Also, as mentioned, these claims are endorsed here only for the mental representations required to account for linguistic competence, about which more later.

The second component of Fodor's conception of the mind is the computational theory of mind. The basic idea is that mental processes, such as inferential reasoning, are computational processes:

> "([A]t least some) mental processes are computations on mental representations."
> (Fodor 2008: 20)

Computations are understood by Fodor in the way defined by Turing, who shows that algorithms can be broken down into small steps that can be performed stepwise by a physical device (Fodor 2008: 77). This is also how computations are nowadays ubiquitously performed by digital computers (Piccinini 2009: 3)[4]. The extraordinary importance of Turing's theory of computation lies for Fodor in the fact that it shows how rational processes can be realized as causal processes, which offers a fundamental explanation of how rational processes can occur in the material world (Fodor 1991b: 285). With Turing's computations, it is possible to think of mental processes as computational processes and thus as causal processes, which allows for a materialistic view of the mind without being eliminative of non-physical properties such as intentional and semantic properties. This is possible because of Turing's insight that causal processes can be set up such that they respect a relevant if causally inefficacious property, for instance the semantic property of truth:

> "In a nutshell: token mental representations are symbols. Tokens of symbols are physical objects with semantic properties. To a first approximation, computations are those causal relations among symbols which reliably respect semantic properties of the relata."
> (Fodor 1998: 10)

It is important to note that Fodor uses the term "symbol" to denote mental representations with syntactic properties. Similarly important is the fact that for Fodor Turing's theory of computation is the only theory available that can plausibly account for the occurrence of phenomena such as rationality in the natural world (Fodor 2008: 63). The crucial point then is that computation requires the Language of Thought hypothesis:

> "[C]omputation, in the sense Turing has in mind, requires a language of thought."
> (Fodor 1998: 21)

The upshot is that rational processes such as thought have to be understood computationally, which in turn requires the Language of Thought hypothesis. The Language of Thought hypothesis is thus indispensable for the explanatory power of the computational theory of mind:

> "[The Language of Thought hypothesis] [...] makes it possible to mechanize thinking understood as a semantically coherent thought process, which [...] consists of a causal sequence of tokenings of mental representations."
> (Aydede 2010)

In other words, the powerful notion of computation provided by Turing is available to explain how rational processes can occur in physical world only if one accepts that the mental representations the computations are defined over have syntactic structure, which means subscribing to the Language

[4] Piccinini discusses the interesting question whether the computational theory of mind is committed to view that the mind has the same Von Neumann architecture that digital computers have, and whether that is plausible. Unfortunately, this issue goes beyond the core topic of this thesis, so it cannot be discussed in detail here. For further discussion, see Piccinini (2008, 2009).

of Thought hypothesis[5].

An important remark here is that Fodor's picture of the mind is based on the idea that the causal potential of content can be explained via the syntactic properties of the entities that have the content in question. In Fodor's words, mental processes as computations are "syntactically driven" (Fodor 1998: 38). This is to say that semantic properties as such do have not causal powers, only syntactic properties do[6]. Even so, this does not mean that ascribing semantic properties has no explanatory value. While the working of a causal mechanism is explicable purely in causal-syntactic terms, its function only makes sense in semantic terms. For example, an inference can only be understood as rational if it is understood as a computation from true premises to a true conclusion. It is evidently possible to specify the mechanism of a truth-preserving causal process without appeal to the semantic property of truth, but one cannot understand why it is rational and hence useful to have without appealing to the non-syntactic property of truth. How a computational process functions is a purely a causal-syntactic matter, but understanding what its purpose is requires semantic terms. That way, the semantic theory has explanatory importance, not in terms of explaining the causal nature of cognition, but in terms of explaining its fundamental function.

What picture emerges at this point on the relation between RTM, CTM and the Language of Thought hypothesis? It is important to note initially that the three hypotheses are metaphysically independent. The representational and the computational theory of mind are clearly mutually independent, as one can have computation without representation, for instance based on a formal language without meaning, as well as representation without computation, as in the case of non-semantic representation, such as the representation of images by virtue of similarity. Moreover, both are independent of the Language of Thought hypothesis. Images can be representational, and it is possible to define computations over them. Fodor's approach is thus based on three independent components. It combines two theses about the functions of the mind, namely representation and computation, with a thesis about the functioning of the mind, namely that it represents and computes by means of a language-like system of mental representations. However, even if metaphysically independent, Fodor maintains that they are nonetheless very closely connected. On the one hand, the powerful computations Turing shows to be possible in terms of symbol manipulation require a syntax. Hence, if it can be established that the mind performs such powerful computations, then the computational theory of mind requires the Language of Thought hypothesis. On the other hand, the assumption of a representational system with a syntax allows for representation to be understood in semantic terms. So if this can be shown to be necessary as well, for instance by arguing that one can only understand the representation of complex states of affairs

[5] Turing basically shows that algorithms can be realized by small stepwise causal changes, such as changing a written value from "1" to "0". This minimally requires that the a system that performs these computations can support a binary system, generally represented by "1"s and "0". Hence, it requires the availability of at least two distinct states to physically encode information and to support computation. This is evidently known to be possible physically, as shown by digital computers, which have circuits that are either on or off and which can be arranged into more complex circuits. It also known to be biologically possible, as base pairs for instance can biologically encode information and they can also be arranged into complex DNA. Finally, it is also known to be neurologically possible, with neural spikes that can be arranged into complex sequences called "spike trains" to encode complex information (Piccinini 2008: 59).

[6] So content is causally efficacious only via the syntactic properties of the symbols that encode the content. This requires that there is at most one semantic value for each syntactic vehicle, but it allows for distinct vehicles to have the same value, as Fodor, who is a Referentialist, assumes. It is also possible, however, to assume a one-to-one correspondence between syntactic vehicles and semantic values, which is what this thesis assumes for extrinsic content. The reason is that Fodor assumes that co-referential mental representations have the same semantic content, while the current proposal is based on the idea that they have the same intrinsic but not the same extrinsic content.

as semantically compositional, that is, as being a function of the syntactic structure of a complex representation and the semantic content of its basic constituents, then the representational theory of mind likewise requires the Language of Thought hypothesis. Thus, Fodor's claim is that in order to fully do justice to both the computational and representational capacities of the mind, it has to be assumed that the mind makes use of a representational system with a language-like structure as posited by the Language of Thought hypothesis.

Is the assumption that human minds have such capacities reasonable to begin with? First of all, it is clear that human minds are able to represent very complex states of affairs that are very remote from the basic representation of simple objects and properties. It is also evident that human minds have strong inferential capacities, which allows them to move from true premises to very complex yet true conclusions. Combined, these capacities are highly productive, as they allow for complex reasoning on representations of highly complex state of affairs. An observable example of a cognitive capacity that arguably relies on both these capacities is counterfactual reasoning. As counterfactual reasoning is clearly useful for an organism, it shows that both representation and computation are advantageous from an evolutionary point of view. Accordingly, Fodor's general argument is that the Language of Thought is required to accommodate the empirical fact that human minds have evolved with such complex and powerful capabilities.

Fodor also relies on two specific features of the mind that have to be explained, namely productivity and systematicity, to make his case. Fodor starts from the observation that it is an empirical fact that beliefs have these properties:

> "Beliefs are productive in that there are infinitely many distinct ones that a person can entertain (given, of course, the usual abstraction from 'performance limitations'). Beliefs are systematic in that the ability to entertain any one of them implies the ability to entertain many others that are related to it in content. It appears, for example, to be conceptually possible that there should be a mind that is able to grasp the proposition that Mary loves John but not able to grasp the proposition that John loves Mary. But, in point of empirical fact, it appears that there are no such minds."
> (Fodor 1998: 26)

The question then is how to account for the observable systematicity and productivity of belief. Based on the representational theory of mind, Fodor argues that beliefs are constituted by mental representations. On this view, thoughts, which are complex mental representations, are the content-bearing components of belief. This means that a belief to the effect that p is constituted by the thought that p and a believing attitude towards that thought[7]. It follows that if belief is productive and systematic, it has to be assumed that thought is systematic and productive as well. Importantly, this means that while one can know that thought is productive and systematic because of the knowledge that belief is, it is the fact that thought is productive and systematic that actually explains why belief is:

> "[W]hat explains the productivity and systematicity of the propositional attitudes is the compositionality of concepts and thoughts."
> (Fodor 1998: 27)[8]

[7] Or to its content, by virtue of its bearer.

[8] Fodor speaks of the compositionality of thought rather than its systematicity and productivity here. The reason, as will explained in what follows, is that the compositionality of thought ultimately explains the systematicity and

The systematicity of thought concerns the observable fact that if a person can think of some object b as being F and c as being G, then that person can always think of b as being G and c as being F as well. The productivity of thought pertains to the unlimited capacity to form different thoughts based on finite means. With only finite resources, the mind is able to generate an infinite amount of complex thoughts. An important observation for Fodor is that these features as shared by natural languages. Any language that contains sentences such as "b is F" and "c is G" also contains sentences such as "b is G" and "c is F". Languages also offer an infinite amount of complex sentences on the basis of a finite vocabulary and a finite set of syntactic rules. The features of natural languages are commonly explained by the fact that languages have a combinatorial syntax and the fact that the semantics of a complex expression is a function of its syntactic structure and the semantics of its basic constituents, which is captured by the principle of compositionality:

> "a system of representations is 'compositional' if the syntactic/semantic properties of the complex representation are fully determined by their structural descriptions together with the syntax/semantics of their primitive parts."
> (Fodor 2008: 106)

Fodor's suggestion is therefore that the assumption that the representational system of thought is compositional offers an explanation of why thought, and hence belief, is also both systematic and productive. That way, the explanation relies on the idea that thought is a language-like representational system with a combinatorial syntax and a compositional semantics.

How does compositionality explain systematicity and productivity, though? To begin with, it is important to note that what needs to be explained is not simply the fact that minds can be systematic and productive, but the stronger fact that they apparently cannot but be systematic and productive. What has to be explained is the fact that minds are systematic and productive "as a matter of psychological law" (Fodor 2004: 37). Hence, Fodor argues that it has to be assumed that:

> "systematicity and productivity are grounded in the 'architecture' of mental representation"
> (Fodor 1998: 26)

The cognitive architecture must therefore be such that it explains why thought, and hence belief, cannot but be systematic and productive. The first crucial feature Fodor invokes to explain the systematicity and productivity of thought is constituent structure, which is the idea that complex mental representations like thoughts have constituents as proper parts. Thoughts are structured entities that literally contain their constituents, similar to the way sentences contain words. This explains why, as a matter of psychological law, a mind that can form the thought "aRb" to the effect that object a stand in relation R to object b, can also form the thought "bRa", as required per systematicity. The reason is that the ability to entertain the thought "aRb" entails that a mind has at its command the mental representations for "a", "b" and "R" as well as the capacity to combine them in a complex structure "xSy" to the effect that some x stands in some relation S to y. Hence, it follows that such a mind cannot but be able to form the thought "bRa" as well. The same holds in view of productivity. If a mind can form the thought "a&a", it ipso facto has

productivity of thought, which in turn explains the systematicity and productivity of belief. This does not change the point here that the relevant features of thought are explanatory for the relevant observable features of belief.

the capacities to form the more complex thought "a&(a&a)", and so on, up to the limitations of performance.

This is not yet sufficient as an explanation, however, as the ability to entertain a thought is more than just the ability to form it. The ability to merely form a thought is analogous to the ability to write down a complex natural language sentence, but what has to be explained is the mental counterpart of the ability to understand the complex sentence, which is to know what it means. This is where compositionality becomes relevant. As mentioned, the core issue in need of explanation is the law-like ability of the mind to entertain systematically related and systematically more complex thoughts. A plausible explanation of this ability is based on the idea that knowledge of the syntactic structure of a complex expression and the semantic content of its basic constituents is, as a matter of principle, sufficient for the knowledge of the semantic content of the complex expression. This is the case if the syntactic structure of a complex expression and the semantic content of its basic constituents fully determine the semantic content of a complex expression, which is precisely what the principle of compositionality states. That way, the assumption that thought is compositional can account for the law-like systematicity and the productivity of thought.

So how exactly does compositionality explain systematicity and productivity? On the assumption that a mind is able to represent some object a as standing in relation R to b, which is the ability to think "aRb", it follows from the constituent structure that the mind is also able to form the thought "bRa". By reason of compositionality, it also follows that the mind is able to entertain that thought, as the mind thereby knows everything that fully determines the complex content of that thought. That way, the combinatorial syntax and the compositional semantics of thought explain the systematicity of thought and belief. The same is true for productivity as well. If a mind is able to think "a&a", it also has access to the semantic content of, say, "a&(a&a)", and so on indefinitely, up to the limitations of performance. The reason is again that the compositionality of thought entails that whatever determines the semantic content of "a&a" also fully determines the content of more complex constructions such as "a&(a&a)". As a result, the compositionality of thought accounts for the fact that in its capacity for thinking, the mind cannot be but systematic and productive. Put differently, the fact that the semantic content of complex expressions is recursively determined explains why thought has to be both systematic and productive.

Incidentally, it is sometimes argued that thought is not really systematic. The reason is that while people can entertain the thought that John drinks a glass of milk, people cannot really entertain the thought that a glass of milk drinks John (Carruthers 2009: 98). However, this point is based on a confusion between what it takes to entertain a thought and what it takes to imagine what the world would have to be like for the thought to be true. Systematicity is not supposed to pertain to the latter. That people can actually entertain such thoughts is shown by the fact that they can know it to be impossible, which means that they can know that it is false. But how could people know this if they could not even entertain the thought? In that sense, people have a sense of what it would take for the thought to be true, namely that a glass of milk has to drink John. People can also entertain the thought to interpret utterances to the effect that a glass of milk drinks John. Moreover, people can also entertain the idea that the thought is true in order to perform conditional reasoning. What people are arguably unable do is to imagine what the world would have to be like for the thought to be true. The same holds true for many such thoughts, such as the thought that an invisible blue dream just finished painting the abstract number five. Systematicity, however,

does not pertain to the imagination but the capacity of the mind to entertain thoughts for purposes such as reasoning and the interpretation of speech.

At this stage it is helpful to point out the empirical nature of the Language of Thought hypothesis as well the underlying realist approach to propositional attitudes. Fodor makes the following observation:

> "[T]here is no obvious reason why behaviourally grounded inferences to attributions of concepts, meanings, mental processes, communicative intentions, and the like should be freer from normal inductive risk than, as it might be, perceptually grounded attributions of tails to cats. The best we get in either case is "strong but fallible evidence". Contingent truths are like that [...]"
> (Fodor 1998: 5)

Similarly, Fodor states:

> "RTM and CTM are supposed to be at best empirical theses, it's at best contingent that there is anything that's both semantically evaluable and a domain for mental processes."
> (Fodor 2008: 93)

Although Fodor makes these points primarily to reject philosophical demands for conceptual truths, what is important here is the empirical nature of the hypothesis[9]. In other words, Fodor's claim is not that it is necessary for the mind to use a language-like symbolic system of representation, it is rather necessary to assume that it does to explain the capacities the mind has as a matter of empirical and contingent fact. Ultimately, the truth of the hypothesis is exclusively an empirical matter. This does not mean, however, that the hypothesis can only be based on empirical evidence.

How can non-empirical arguments establish empirical facts? The answer is that there can be arguments to the effect that alternative explanations of mental processes have to be excluded as they are in principle unable to explain the empirically observable phenomena[10]. That way, non-empirical arguments about the explanatory power of theories about mental processes can establish the truth of a theory that remains true only as a matter of empirical fact. In its empirical status, the Language of Thought hypothesis is thus comparable to the theory of atoms. In both cases, the theories posits non-observable entities (atoms and concepts, as well as molecules and thoughts) to explain observable phenomena (everyday objects and behavior). Specifically, such hypotheses are inferences to the best explanation. They are based on the claim that alternative theories cannot explain the observable phenomena that need to be explained as well as the proposed theory does[11].

As the analogy with the theory of atoms already suggests, the approach is also realist with regard to propositional attitudes such as beliefs[12]. The thesis that such beliefs are constituted by complex

[9] Although widely accepted, it is not universally acknowledged. For a dissenting view see Rey (1995).

[10] This is evidently the charge against Connectionism, notably that it cannot accommodate the law-based systematicity and productivity of thought.

[11] In this vein, and against Connectionism, Fodor often speaks of the Language of Thought hypothesis as the "only game in town". That claim is arguably to strong, but it is plausible to agree with Fodor that the Language of Thought hypothesis so far remains the best theory to explain human cognition with respect to linguistic production and understanding. More about this later.

[12] As explained repeatedly, the relation between a belief and a thought is as follows. The thought is the content bearing part, to which belief part adds the attitude. So in the belief that the sky is blue, "that the sky is blue" is the thought, and the belief adds to this the attitude that the thought is true. Believing and fearing that John is happy involves the same thought but a different attitude, while believing that John is happy and believing that John is sad involve the same attitude but a different thought. Accordingly, a true belief is in fact short-hand for a belief of which the

mental representations with semantic content is a literal suggestion about what beliefs are, and not just as an analysis of how people commonly and pre-theoretically speak when they attribute beliefs to others. Fodor clearly rejects what he takes to be a possible instrumentalist position:

> "[S]ome philosophers were prepared to live with beliefs and desires only as explanatory fictions: creatures like us behave 'as if' we had them."
> (Fodor 2008: 5)

This recommendation evidently pertains to occurrent rather than dispositional beliefs, where the notion of an occurrent belief encompasses the beliefs currently entertained as well as those stored in memory. In contrast, purely dispositional beliefs are presumably those beliefs that can in some sense be correctly ascribed to a person even if they are not part of that person's occurrent beliefs. For instance, it is in a sense correct to say that everybody believes that elephants cannot fly even if painted blue even if nobody has ever actively entertained that thought. Arguably, purely dispositional beliefs are best understood as denoting not a type of belief but the obvious consequences of what is ocurrently believed[13]. Accordingly, dispositional beliefs are not supposed to be real in the way that occurrent beliefs are, for instance in the sense that they contain thought and concept tokens with a specific spatio-temporal location.

Before considering the points where the thesis diverges from Fodor, a brief remark on some widely circulated misconceptions regarding the Language of Thought hypothesis. The Language of Thought hypothesis is often rendered as the view that thought is based on "sentences in the head" (Bilgrami 1998: 115). Although correct, it is important not to take this as a naive suggestion that there are sentences written in the brain just as there can be written sentences on a piece of paper. The idea is rather than the brain encodes complex sentential structures in a similar way digital computers do. Simply looking into a digital computer, however, does not make this obvious, and the same is true for the brain[14]. The proposed view is rather that on a sufficiently abstract level, the structure in the brain causally responsible for language production and understanding is adequately described as system of symbols with semantic content on which computations are performed (Aydede 1995).

Similarly, the claim that the Language of Thought is like a language, while correct, can also be misleading. It is true in the sense that thought is assumed to have syntactic and semantic properties, which are also commonly ascribed to natural languages, but the Language of Thought evidently differs in many other respects from natural languages. For instance, there is no phonology for the Language of Thought, nor does it have a pragmatic dimension that explains its use. Moreover, the Language of Thought cannot be used for communication in the way a natural language can. Also, Language of Thought strings are not ambiguous like many natural language strings are. Finally, it is also assumed that there is only one Language of Thought shared by all humans, while there are of course many distinct natural languages. Hence, the Language of Thought hypothesis is more cautiously characterized as the view that thought is based on mental representations in a symbolic representational system with both syntactic and semantic properties.

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thought it contains is true, and a belief that p is a belief that p because the thought it contains has the content p.

[13] On this view, it is in fact misleading to speak of dispositional beliefs. It would be better to speak of dispositions to believe, which make it clear that such dispositions are not instances of belief.

[14] This is also why the obvious truth that the brain contains neural networks is not sufficient to show that Connectionism is true and the Language of Thought hypothesis is false, as some people seem to assume.

Finally, a brief comment on an argument occasionally produced against the Language of Thought hypothesis. Philosophers who have attempted to explain what it is for a natural language to be meaningful have rejected the Language of Thought hypothesis as a kind of regress, on the basis that it assumes that the Language of Thought is a "meaningful" language, which is precisely what needs to be explained (Margolis and Laurence 2007: 570)[15]. In fact, they have mounted a two-pronged attack against the hypothesis. On the one hand, they point out that a proponent of the Language of Thought needs to explain what it is for the Language of Thought to be meaningful, which shows that positing such a language is of no help for answering the initial question about the meaningfulness of languages in general. On the other hand, they argue that if the proponent has an account of the meaningfulness of the Language of Thought, then that theory might as well be directly applied to natural languages, without detour via a Language of Thought. In either case, positing a Language of Thought thus serves no useful explanatory purpose.

The main problem with the argument is that it assumes that the type of explanation that can be provided for the Language of Thought is exactly the same as for any natural language. In light of the many differences between thought and language pointed out, however, that assumption is rather dubious. Specifically, another major difference is that natural language is plausibly invested with meaning through interpretation, which is not the case for the Language of Thought. This difference is the basis for the claim that natural languages have semantics only in a derivative sense, while the Language of Thought has a semantics as a matter of empirical fact, which explains why thoughts are not understood in the way sentences are. Thoughts are not interpreted, they are entertained. Accordingly, the proponent of the Language of Thought hypothesis can reject this criticism by maintaining that the meaningfulness of the Language of Thought is likely susceptible to a different kind explanation than the meaningfulness of natural language. For instance, it may well be that the reference of Language of Thought expressions can be naturalized as an asymmetric causal dependence relation, while the same is not true for the purported reference of natural language expressions (Fodor 2008: 204). This shows that the Language of Thought hypothesis is far from theoretically useless.

That is not to suggest that the current proposal endorses Fodor's attempt to naturalize semantics, however. Ultimately, the proposed view is that the basic semantic relations such as reference and coordination cannot be explained in terms of something that is more basic and non-semantic. In a sense, this is to accept that the Language of Thought hypothesis explains the meaningfulness of natural languages only in a rather insubstantial way, as it presupposes the meaningfulness of another language as empirically given. This is not a major concern, however, as the primary aim in this thesis is not to account for the basic meaningfulness of languages in general, but to provide an plausible picture of linguistic competence. In other words, the view is not that the Language of Thought hypothesis can help to explain the existence of semantic properties. Instead, the existence of a Language of Thought with semantic properties is accepted as an empirical fact about reality[16].

[15] See also Aydede (2010).

[16] A further difference between a natural language and the Language of Thought is that the meaning of a linguistic expressions is arbitrary in the sense that it is purely a matter of convention, while the semantic content of Language of Thought expressions is arbitrary only in the sense that semantic content can be multiply realized, which entails that the same semantic content can be realized by different mental symbols. So what if not convention determines what the content of mental symbols is? Functional role semanticists have an answer to this. The question is not a concern, however, if one is a realist about semantic properties. What semantic content specific mental symbol tokens have is a matter of empirical fact.

3.3 Diverging from Fodor

Although the current proposal broadly shares Fodor's approach to the mind, at least to the extent that it is offered as an explanation of linguistic capacities, it also diverges from Fodor in important respects. These divergences are rather briefly listed here, as the main objective is not to argue that Fodor is mistaken, but rather to point out that a commitment to the Language of Thought hypothesis does not necessarily entail a commitment to many of the other claims for which Fodor is well-known. In fact, the underlying aim in the thesis is to offer a very minimal version of the Language of Thought hypothesis on which thoughts are assumed to be syntactically structured mental representations with semantic content that explain linguistic competence. Anything beyond this fundamental claim is not essential to the Language of Thought hypothesis.

The first divergence exists in terms of the main focus of Fodor's proposal. In his latest contribution to the topic, Fodor's main objective is to argue against "concept pragmatism", which is the idea that "[w]hat's essential to thought is not its relation to the things in the world that it represents but its relations to the actions (the 'behaviors') that it guides." (Fodor 2008: 8). Although Fodor's case is convincing, the issue is disregarded in the thesis, as it is based from the outset on the assumption that there are substantial representational relations between minds and mind-external objects. Another substantial difference concerns the fact that the current proposal does not share Fodor's commitment to concept nativism, which is the idea that concepts cannot be learned but have to be innate (Fodor 2008: 130). Similarly, the thesis does not endorse Fodor's attempts to explain the metaphysics of reference in non-semantic terms as "reliable correlations between things in the world and symbols in the head" (Fodor 2008: 143, footnote 14). While Fodor's arguments in these areas are considered less convincing than his case against pragmatism, neither issue is a concern here, as they are not significant for the main objectives of the thesis.

A little more can be said about the metaphysics of reference, however. Fodor maintains that a naturalistic account of semantic content is essential for a naturalistic account of the mind. That is why Fodor first argues that content consists only of reference, and then attempts to naturalize reference (Fodor 2008: 50-51). Although this thesis does not offer a specific argument against Fodor's strategy, it has some results that call it into question. The most important point is that it shows that reference alone is not sufficient for semantic purposes, which undermines the first step of Fodor's strategy. This casts doubt on the second step as well, as it shows that there are non-reducible semantic relations beyond reference, so that little motivation remains for the attempt to reductively explain reference in non-semantic terms. If an adequate theory of content for the Language of Thought has to accept non-reducible semantic relations anyway, why not just accept that reference is one such a relation as well? Moreover, there is the widely shared view that Fodor's reductive attempts regarding reference have not been successful, and the nature of the problems faced by Fodor in this respect suggest that the outlook for ultimate success seem rather dim.

In addition, the current proposal also disagrees with Fodor's basic motivation for naturalizing semantic theory in a reductive way, as it does not accept that providing non-semantic explanations for semantic terms is necessary to offer a naturalistic account of the mind. The proposal thus disagrees with Fodor that naturalizing the mind requires that its representational character can be specified in purely physical terms. Instead, the view is that at least for the limited scope envisaged, the mind can be fully explained only by means of both physical and semantic properties. As there

is no reductive account of semantic properties, this means that the account is not reductive, but that does not mean that it is thereby necessarily non-naturalistic. It is in fact possible to opt for a non-reductive but naturalistic account of semantic properties. The basic idea is to make semantic properties naturalistically respectable not by reducing them to non-semantic properties but by expanding the scope of the natural to include semantic properties. On this view, semantic properties are considered as empirically real and substantial as other physical properties. This is important in view of an observation Fodor makes:

> "We've been talking about LOT and CTM in the context of a naturalistic theory of mind; which is to say, in the context of a naturalistic theory of (mental) content. The difference between saying that there's no such thing as mental content and saying that yes there is, but it's not a natural phenomenon, strikes me as not worth arguing about." (Fodor 2008: 51)

Fodor's point is that saying that there are semantic properties which are not natural properties is actually the same as saying that there really are no semantic properties. Whatever Fodor's motivation for this, the important point is that on the proposed view semantic properties are considered natural properties. The difference is rather that the proposed view is based on the idea that the realm of the natural is larger than Fodor allows for[17].

Two final points on which the current proposal diverges from Fodor have to be clarified. The first issue is the obvious fact that Fodor endorses a different theory of content for the Language of Thought. Fodor famously assumes that the Language of Thought has a Referentialist semantics (2008: 16-18). The current proposal adopts a Relationist semantic theory for the Language of Thought instead. How such a semantic theory can be applied to the Language of Thought, and why it should be, is the topic of subsequent chapters[18].

The second point concerns Fodor's view on propositions. Although Fodor endorses a contentious conception of propositional attitudes, he adopts a classical conception of propositions. On Fodor's view, mental states such as beliefs are "relations between creatures, their mental representations, and propositions that their mental representations express." (2008: 5). On this view, beliefs are relations to thoughts that express propositions. Whatever the metaphysics of propositions, the crucial aspect here is that for Fodor propositions are entities that are the contents expressed by thoughts, which are the bearers or vehicles of content. On the alternative conception advocated in this thesis, propositions are considered structured content-bearers rather than structured contents. Specifically, the view is that propositions are what Fodor calls thoughts, while what Fodor calls propositions does not exist. Evidently, the divergence is to some extent purely terminological about

[17] In case one may wonder what the usefulness of such an account of the mind is, in that it provides no explanation of basic semantic relations, one should remember that a semantic theory mainly provides a systematic theory of the content of complex expressions based on the content of their basic constituents and their syntactic structure. For the mind, this will be a systematic theory of the content of complex thoughts. A semantic theory for a natural language similarly does not generally provide an account of how basic expressions get their meaning, nor does it explain what that meaning consists in. It takes the basic vocabulary as a given, and explains the meaning of sentences on the basis of that vocabulary and syntax. Evidently, not explaining everything is not the same as not explaining anything.

[18] It should be mentioned here that in his latest major contribution on the topic, Fodor argues for Referentialism on the basis of the fact that only reference composes (2008: 18). His arguments, however, are directed mostly at holistic semantic alternatives. Since both Fregean senses and coordination relations in fact compose, Fodor's arguments for Referentialism on the basis of compositionality are largely ignored here. Instead the focus is on the ontological and epistemological arguments Fodor presents against Fregeanism, with a view to showing that they are not problematic for Semantic Relationism.

what to call "proposition". There are, however, substantial issues that depend on this as well, for instance about what entities play the role commonly associated with propositions or what the nature of semantic content is. More will be said about this in an independent chapter on propositions. At this point, an interesting analogy between concepts and propositions in this respect has to suffice. Fodor maintains that concepts are mental representations, thereby rejecting the Fregean view on which concepts are senses. The upshot is that for Fodor concepts are no longer contents, but bearers of content. They are entities that have rather than are content. The proposal in this thesis is to adopt the same view on propositions, which means that propositions are considered syntactically complex entities that have content rather than entities that are content.

3.4 Linguistic Understanding and Communication

The aim in this section is to outline how the Language of Thought hypothesis is connected to the theory of linguistic understanding and communication. The basic model relies essentially on a positive and a negative claim. The positive claim is that linguistic understanding consists in the translation of natural language strings into thought, and linguistic communication in the transmission of thought by means of natural language. This picture plays an important supportive role for Fodor's argumentative strategy. Fodor's view is that if natural language is both systematic and productive, which by empirical observation it clearly is, thought has to be as well. The reason is that otherwise thought would not have enough expressive power to play its role in linguistic understanding and communication (Fodor 1998: 55)[19]. The associated negative claim is that on the current proposal, the Language of Thought is posited with a very limited scope, namely only to the extent that it is required to account for cognitive capacities of a linguistic nature. This means that the proposal does not commit to the Language of Thought hypothesis to explain other mental capacities, such as perception. Even if an argument for the plausibility of a Language of Thought based approach to other cognitive processes would strengthen the overall plausibility of the hypothesis, the potential existence of syntactically structured mental representations in non-linguistic domains would still be largely irrelevant for the truth of the Language of Thought hypothesis in view of explaining linguistic capacities. It is of course obvious that linguistic capacities are the most plausible candidate to be explained by the Language of Thought, but that does not change the fact that it could turn out to be the case that a Language of Thought is involved only in non-linguistic mental processes. This is not to suggest, however, that there is an easy demarcation between linguistic and non-linguistic mental capacities. In the case of memory, for instance, it is plausible to assume that if stored beliefs are about very complex states of affairs, they have to be linguistic in nature, for instance the belief that atoms contain electrons. If they are very basic, however, then it is arguably plausible to assume that they are purely perceptual. If correct, this implies that the border between the linguistic and the non-linguistic domain is vague, which is then also true for the scope of application of the Language of Thought hypothesis to which the current proposal is committed.

So how does language work on the Language of Thought based approach to the mind? There

[19] The claim here is evidently epistemological not metaphysical. One can know that thought has to be compositional because natural language is. Even so, Fodor maintains that metaphysically, a compositional natural language can only exist because there is compositional thought. Thought is secondary in the epistemological order, but prior to natural language in the ontological order (Fodor 2008: 216, footnote 26).

are three distinct cases of language use that have to be considered to address this question. First, there is linguistic understanding, also called comprehension or interpretation, then there is language production and finally linguistic communication. The basic idea is best explained for understanding:

> "English has no semantics. Learning English isn't learning a theory about what its sentences mean, it's learning how to associate its sentences with the corresponding thoughts."
> (Fodor 1998: 9)

On the view proposed by Fodor, mastering a natural language consists in the ability to associate the right thoughts with natural language strings, which amounts to the ability to effect a correct "translation between English and Mentalese" (1998: 97)[20]. In terms of linguistic theory, the corresponding view is that the deep structure posited for natural language strings "should be taken as representing translations of English into Mentalese." (Fodor 2008: 219). Using a terminology that differs from Fodor's, the basic idea is as follows. To begin with, one has to make a fundamental distinction between a theory of semantic content and a theory of meaning. A theory of semantic content includes a theory of reference and it applies only to thought. A theory of meaning is a theory of correct word-concepts associations, and it applies only to natural languages. To give an example, a theory of meaning states that the natural language expression "dog" means DOG, where the latter stands for a concept. Hence, the linguistic meaning of the word "dog" is such that it is correctly understood if it is associated with the concept DOG. The semantic theory in turn states that the concept DOG refers to the property of being a dog. So while the theory of meaning associates a term of one language with a term of another language, the Language of Thought, the semantic theory assigns a semantic content to the latter. As a result, the natural language expression "dog" refers to the property of being a dog only in a derivative sense, namely via the concept with which it is associated. This explains why the account is translational. Natural languages have no semantic content on this view, only the thoughts into which they have to be translated do[21].

On this view, linguistic meaning looks trivial on the surface, as in "dog" means DOG and "cat" means CAT. As Davidson is famous for pointing out, however, this does not mean that such rules do not state substantial knowledge, as becomes evident if the English words are replaced by words of an unknown language. Moreover, even for known languages, meaning is not always that trivial. For instance, the meaning of the indexical "I" is whoever is speaking in the relevant context. In a context where John is speaking, the meaning of "I" is JOHN. This also shows that meaning has to be distinguished from Kaplan's well-known notion of a character, which is more a meaning-rule than a meaning, a rule for determining the correct meaning in a context (Kaplan 1977; 1989). While the character of "I" is constant, its meaning can change from one context to another. The change in meaning is based on the fact that the concept with which an indexical has to be associated per its character can change from context to context, which also explains why an indexical can "refer" to different persons in different contexts[22].

[20] See also (Fodor 1975: 67).

[21] As mentioned, this account diverges from Fodor's terminology. In contrast to what Fodor in the quote above suggests, it is in fact correct to say that learning a natural language such as English is to learn what its sentences mean, but not in the sense of learning its semantic content. This is evidently what Fodor means as well, so the difference is purely terminological.

[22] On Kaplan's view, character is a function from context to extension. On the current view, it is rather a function from context to a concept providing the correct extension. The basic idea is evidently the same.

Given this picture of linguistic understanding, linguistic production is easily characterized as the inverse process. Linguistic production is thus the translation of thoughts into communicable natural language strings. This is evidently not to suggest that such a theory does not require substantial elaboration. Even if in the basic case of, say, DOG, which has to be translated into "dog", the knowledge looks rather superficial, this is clearly not the case in general. For instance, it involves nontrivial knowledge about the order in which natural language expressions have to be put in order to correctly express a given thought[23]. In the case of indexicals, there are also rules about when an indexical can be used or when the corresponding proper name has to be used instead, which are arguably not included in their character as understood by Kaplan. Even so, the fundamental assumption is that these and similar issues do not undermine the basic picture, as there is prima facie no reason to suppose that it cannot survive the extensive elaboration necessary to cover more complex linguistic phenomena.

In view of this understanding of individual linguistic capacities, communication is correspondingly characterized as the transmission of thoughts by means of the alternating deployment of linguistic production and comprehension. In other words, a thought is translated into a natural language string by a speaker and subsequently re-translated into thought by the receiver of the linguistic message. Importantly, this entails as a criterion for successful communication that the thought communicated by the speaker and the thought received by the hearer must have the same content. This model may look overly naive, in that it endorses a view on which communication consists in nothing more than the transmission of messages. That does not mean, however, that the model is incorrect, and it should be kept in mind that this is supposed to be the basic model, which is directly applicable only to the communication of very basic statements. The claim is evidently not that the basic model can by itself explain all the relevant aspects of successful linguistic communication. Rather, the idea is that it can serve as a viable foundation for the more detailed account that is evidently necessary to take into account all the intricacies of natural language communication.

A basic example of successful communication is when a speaker A, who has the simple thought that dogs are annoying, say, intends to communicate this thought to B via a shared natural language. This communication counts as successful if and only if B acquires the thought that dogs are annoying as a result of the communication with A. A major complication arises for this basic picture due to indexical and anaphoric expressions in natural language, especially for the criterion of successful communication. The current proposal is essentially based on a substitutional account of indexicals, on which referring indexicals have to be replaced by proper name-like constituents in thought. If A uses "he" to refer to John, for instance, then B has to substitute that anaphoric expression in thought with the concept JOHN to count as having understood what A said. Clearly, the difficulty is to say in specific cases what the correct substituting concept is. For instance, what concept has to be shared between the speaker and the hearer for communication to be successful in case the indexical "I" is used? It is very tempting to impose only a very weak condition on linguistic understanding by maintaining that a co-referential concept is sufficient, which means that as long as the proper name-like concept of both speaker and hearer are about the same object, an instance of linguistic communication about that object counts as successful. This cannot be correct in general, however, if else a communication between two Ancient Greeks where one is speaking about Phosphorus and the other understands him as speaking about Hesperus would count as successful,

[23] This is shown for example by the difference between saying that something is not really helpful and saying that something is really not helpful.

which is clearly not the case[24]. This shows that something additional is required, something like a concept with a shared Fregean sense. Frege, however, is famous for his argument that everybody is presented to himself in a very special way, which is why the expression "I" can never have the same sense for distinct speakers (Frege 1918: 66). If Frege is correct, the shared sense option is not available, as a hearer could never match the speaker's mode of presentation of himself in the use of the first person indexical. The difficulty Frege sees in this respect is arguably at least partly due to his commitment to the view that senses are modes of presentation, which can be rejected. Even so, there will be cases where it is hard to say what sense is exactly shared between the speaker and the hearer, for instance in case a hearer has no knowledge whatsoever about the speaker who uses the indexical "I".

It is clear that Semantic Relationism ultimately faces a similar worry. If the Relationist maintains that sameness of reference is not enough for successful communication, it has to be explained in what sense there is coordination between the underlying concepts, or alternatively, what else accounts for successful communication in such cases. One option for the two-tier semanticist is to make an exception in the criteria for successful communication for concepts that underlie the use of indexicals. The two-tier semanticist could maintain that a co-referential concept is sufficient for successful communication in case it was derived correctly via the character of the indexical. A general rule would then state that successful communication requires co-referring concepts that are derived in the right way, which generally means a coordinated concept (or a concept with the same sense), but can mean an uncoordinated concept (a sense-distinct concept) if it is based on the correct interpretation of the meaning of an indexical on the basis of its character[25]. Alternatively, the theorist can uphold the universal necessity of a coordinated concept for successful communication by arguing that in the case of indexicals, there is in fact coordination between the two underlying concepts if the concept of the hearer is adequately derived from the indexical used by the speaker. So rather than loosening the criteria for successful communication to include uncoordinated concepts to cover cases involving indexicals, the idea is to loosen the criteria for when coordination between concepts holds. Either way, this has to suffice to show that there are in fact ways to address the difficulties raised by indexicals. This does not mean, of course, that a comprehensive solution is thereby provided, but it indicates that options are available, which justifies the assumption that the basic picture can be maintained in the face of the complications introduced by indexicals.

Before concluding this section, a final clarification. A basic claim endorsed here is that linguistic understanding consists in the ability to effect proper translations from natural language sentences into thought. On this view, translation can manifestly not be understood in the traditional sense, in which a translation between two sentences is correct if it preserves the semantic value. This is the sense in which it is usually said that a sentence in English properly translates a corresponding sentence in German if they have the same content[26]. The reason this cannot be the right conception

[24] More is said about this view later on, as it is surprisingly common in the literature to claim that successful communication only requires sameness of reference.

[25] So the hearer has to know that "I" as used in a given context by John refers to John because "I" generally refers to the speaker and because John is the speaker in that context.

[26] Plausibly, sameness of content is the exception rather than the norm for successful translation between natural languages, given how different they can be in structure. This is easily overlooked by looking only at languages with a lot of shared structure, such as English, German and French. For translation, an inferential role based account is arguably more plausible. On this view, a word in one language is the correct translation of a word in another if the overall role of the word in the target language is the closest match to the role of the word in the source language. That way, semantic content will not be holistic, but translation will be. This does not affect the point made here,

of translation is that the proposed view assumes that strictly speaking natural language sentences do not have semantic values. Instead, the notion of a translation is used here because it correctly suggests that understanding consists in the transition from one language to another, on a minimal understanding of what it requires for something to be a language[27]. If the preservation of semantic value is given up, however, a reasonable question is how a translation between a natural language sentence and a thought can be said to be correct or incorrect. The answer is roughly that a translation between a natural language sentence and a thought is correct if it is in accordance with the way the majority of a linguistic community would translate it[28].

It should be clear at this point that the approach to language endorsed so far requires a criterion for the individuation of thoughts that is adequate given the role thoughts have for communication. If thoughts have to be the same for successful communication, a theory has to be able to properly identify them across speakers. It was already suggested that co-reference alone is not sufficient, as sameness of reference is not generally sufficient to count an instance of linguistic communication as successful. As the next section shows, this in fact constitutes a major stumbling block for Fodor, who endorses a Referentialist theory of content for the Language of Thought.

3.5 Frege's Puzzle and Type-Identity

The main question behind the type-identity problem for the Language of Thought is rather simple: when do two mental representation tokens count as type-identical? Under what conditions should a theory count two mental representation tokens as tokens of the same mental representation type?

Two remarks are in order to clarify this question. First of all, it is important that the question is raised for Language of Thought expression tokens which are at the same time mental representations. That way, it does not matter if the question is phrased as a question about mental representations, Language of Thought expressions, Language of Thought symbols or even concepts, as these are all considered equivalent in the current context[29]. Evidently, this is not to suggest that all mental representations are Language of Thought symbols. The identification is rather justified by the fact that the thesis is concerned only with those mental representations that are also symbols in the Language of Thought. In fact, it is clear that the question arises for a much broader range of cases, including linguistic expressions that are not mental representations as well as mental

however. The holistic account of translation is just as problematic as the traditional account in terms of the transition between a natural language and the Language of Thought.

[27] This transitional understanding of translation is captured by Fodor's "syntactic" notion of translation, as it precisely maintains the idea that two languages are involved while abandoning the idea it involves anything semantic, such as the preservation of semantic value (Fodor 1998: 97).

[28] This of course raises additional questions, for instance what the correct linguistic community is for a language such as English. Is it only Britain for speakers of British-English, and only the US for speakers of American-English, or does it combine Britain and US for all speakers? Clearly, this can make a difference in how the majority uses a word, and hence how a sentence that contains is has to be translated into thought. These difficulties look prima facie solvable, however, and the definition is good enough for current purposes. Also, the idea of majority rule can be stated as the requirement that words have to be used in accordance with their objective meaning, which is what many theorists endorse. It is important to realize, however, that this does not require the assignment of meanings to a natural language as an abstract object that exists independently of the minds of its speakers, as the objective meaning can be derived from the use of the majority of speakers. The objective meaning is simply the meaning that most speakers associate with a word.

[29] The introduction of a stricter terminology would arguably be useful, but this section will desist from doing so, first, because the relevant passages quoted from the literature vary in the terminology they use and secondly, because it should always be clear what is meant in a given context.

representations that are not linguistic expressions. The thesis, however, is only concerned with the type-identity of tokens that are both mental and linguistic in nature.

A second issue pertains to the metaphysical nature of tokens and types tacitly presupposed in the question. What kind of objects are tokens and types? Rather than to attempt to answer this question, it is useful to follow standard practice by starting from an intuitive conception of both tokens and types that can be derived from everyday linguistic examples. A written token of a sentence to the effect that Peter likes Peter (as in himself) can serve as an example. The question commonly used to introduce expression types and tokens is the question how many proper names the written sentence token contains. The answer depends on whether one asks about proper name types or tokens. The sentence token contains only one name type, namely "Peter", but it contains two tokens of that name type. This brings out the intuitive and pre-theoretic understanding of the type/token distinction from which the discussion can proceed[30]. The intuitive view that corresponds to this for the Language of Thought is roughly as follows. Mental representation tokens are concrete objects with physical properties and a spatio-temporal location. As such, they come into existence at a specific point in time in the brain, and they vanish at the latest with the decease of the proprietor of the brain[31]. Mental representation types are metaphysically harder to characterize. For current purposes, it has to suffice to say that in contrast to tokens, a Language of Thought expression type is a kind of abstract object without spatio-temporal location.

On the resulting view, mental representation tokens exist as concrete objects in the world as a matter of empirical fact. The fundamental issue then is to explain when to count two of these concrete entities as type-identical, and when to count them as type-distinct. In the concrete example of the thought that Peter is Peter, the first issue is therefore to say whether the two mental representation tokens for Peter count as type-identical, and if the answer is yes, to then explain why[32].

The discussion of type-identity problem for the Language of Thought hypothesis is initiated by Pessin (1995) and Aydede (1998). Aydede starts his discussion from the observation that on the Language of Thought hypothesis, propositional attitudes such as beliefs are relations to mental sentences, so that saying that two subjects have the same belief is tantamount to saying that:

> "they stand in the same type of computational relation to token sentences in their respective LOT that are of the same semantic type [...]"
> (Aydede 1999: 2)

[30] Admittedly, the initial question asks about types and tokens of proper names in general, and not of the specific name "Peter".

[31] This does of course not mean that one can recognize physical structures in the brain as Language of Thought expression tokens simply by looking at them. It is only possible to perceive the physical medium that sustains the mental tokens.

[32] This is not supposed to suggest that the type-identity of concrete mental representation token depends on us, as a matter of how we choose to characterize the world by grouping the tokens together. Even on a realist approach to types and the type-identity of concrete tokens, the question remains in virtue of what concrete tokens have the type-identity they do. That said, one option on the realist view is to take type-identity as fundamental, by assuming that the type-identity of a given concrete entity is just a basic empirical fact about that entity. On this view, there will not necessarily be an answer to the question in virtue of what tokens count as being of the same or different type. Such a response is perhaps unsatisfactory if one thinks the initial question needs to be addressed, but that does show that it is mistaken. It will be suggested later, however, that a realist approach to types is not viable, as a complete description of the tokens in terms of types is either inconsistent or incomplete. Accordingly, a realist approach to types, which presupposes completeness, runs into contradictions, which indicates that an instrumentalist approach to types is more promising. That in turn entails that an answer to the initial question is in fact nceessary.

For two subjects to believe the same thing is for each of them to instantiate a Language of Thought sentence token of the same type. Accordingly, the Language of Thought theorist has to answer the question when two mental representation tokens count as type-identical (Aydede 1999: 2). Aydede's main aim in his paper is to argue both that the question is crucial and that Fodor's attempt to address it fails. Fodor's answer to this question is considered in detail later on. For now, the goal is first to properly understand the problem[33].

An important observation Aydede makes is that a satisfactory answer to the type-identity question has to account for two distinct cases of type-identity. First, there is intrasubjective type-identity, which is the type-identity of two mental tokens that belong to the same mind, and secondly, there is intersubjective type-identity, which is the type-identity of two mental tokens that belong to two distinct minds (1999: 2). This observation is crucial mainly because Fodor at first fails to realize that an answer is needed in both cases, and hence proposes a solution that works for the intrasubjective case but fails for the intersubjective case. It is also important, however, as it shows that a theory can potentially address the two cases separately, by offering distinct criteria each suitable for one of the cases[34]. Even if possible, such a non-uniform response is dubious, however, as it clearly is the same question that arises in both cases. There is prima facie no good reason to suppose that the problem requires different answers depending on factors that are actually external to the objects the type-identity of which is at issue[35]. So without a good reason to the contrary, it is plausible to expect a unified response that works for both cases of type-identity[36].

As Aydede is mainly concerned with Fodor's response to the problem, his primary aim is to bring out the importance of the intersubjective version of the problem. His argument is ultimately that Fodor's response to the problem fails for the intersubjective version (1999: 25). Aydede highlights the importance of the intersubjective version for the Language of Thought theorist on the basis of two issues, namely linguistic communication and psychological laws or generalizations (1999: 5-6).

The basic conception of linguistic communication on the Language of Thought based model rests on the idea that linguistic communication consists in the transmission of thoughts through linguistic means. What Aydede emphasizes for propositional attitudes is thus true for thoughts as well. Linguistic communication is fundamentally predicated on the idea of shared thoughts. Successful communication requires that both the participating speaker and hearer each instantiate a thought token of the same type[37]. As a result, the theory of communication requires a suitable criterion to individuate thoughts and their constituents across subjects.

Arguably, the basic picture of shared thoughts even informs the standard approach in linguistics. If a linguist proposes a deep structure for a natural language string, it is assumed that a represen-

[33] Aydede also discusses whether a semantic or a non-semantic criterion is required for type-identity, that is, whether the question has to be answered by appealing to the semantic content of the mental sentences or not. This will also be discussed later on. However, following Pessin, Aydede already rejects a physical criterion of type-identity, viz. the idea that type-identity is based on shared physical properties, for the reason that it runs afoul of the universally accepted fact that content is multiply realizable, which states that a given content can potentially be carried by a multitude of different symbols (Pessin 1995: 35ff.). As this is universally accepted, this option to address the issue is not further considered in the thesis.

[34] Arguably, Laurence and Margolis offer such an approach (2007, 2008).

[35] Laurence and Margolis' view on this matter is purely theory-driven. They propose a solution which works only for one case to then simply add a different solution for the other case.

[36] The disjunctive strategy becomes all the more questionable given that Semantic Relationism in fact provides a unified solution to the type-identity problem.

[37] The complications introduced by indexicals and the like are disregarded here.

tation of that structure, which is a thought on the Language of Thought hypothesis, is shared by all competent speakers in a linguistic community. As these deep structure representation tokens contain as constituents mental representation tokens corresponding to the basic words of the linguistic string, the standard approach is also dependent on the existence of an adequate criterion for their type-identity across speakers. If, for example, a natural language sentence contains the name "John", the corresponding deep structure will contain a mental symbol representing John, which needs to be properly type-identified across speakers. This is in fact crucial for syntactic analysis. Without the proper type-identification of JOHN tokens across speakers, and the ability to properly distinguish them from tokens of, say, MARY, the theory could not adequately state that in a sentence such as "John likes Mary", John does the liking and not Mary, as its deep structure would not be distinguishable from the deep structure of "Mary likes John". Admittedly, this fact is so obvious that it will not seem worth noticing to most linguists, but that is mainly because the example uses different names that obviously refer to distinct persons. However, the same point is true for sentences such as "Kent admires Superman" as well, which is obviously different from the sentence "Superman admires Kent". In order to say that Kent is the subject in the first sentence, but not the second, as required for proper syntactic analysis, the theorist needs to ability to intersubjectively type-identify Kent tokens and Superman tokens respectively. Tellingly, the example already indicates that reference alone is not sufficient, given that both names are co-referential, while the well-known Paderewski cases suggest that homophony is not sufficient either.

The second reason intersubjective type-identity is of great importance concerns psychological explanations on a Language of Thought based approach to the mind, which are provided in the form of psychological laws or generalizations[38]. The laws generally pertain to the rational capacities of the human mind and its ability to effect behavior. For instance, it will be a law-like generalization for humans that if they believe that P and that if P then Q, then they will also come to believe that Q, at least if certain conditions are met[39]. Even if all the relevant conditions are met, however, such a law will evidently not hold universally, unlike a law of physics, as human reasoning is not infallible. Even so, the law-like generalization captures the fact that humans reliably display this inferential capacity, which is a significant empirical fact about the cognitive capacities of humans[40].

The same is true for human behavior as well. For instance, it will be a law that people who desire to bring about P, and who belief that bringing about Q will bring about P, will generally desire to bring about Q. Practical reasoning with beliefs and desires plays an important role in explaining the observable behavior of people. As in the case of reasoning, the predictions about behavior that are derivable from such laws are fallible, but reliable enough to warrant explanation, which is precisely what the laws provide. The laws offer an explanation of why a person desires to bring about Q, namely because of a desire for P and a belief that bringing about Q will bring about P. A concrete example is the behavior of a person going to the fridge, as explained by the fact that the person is thirsty and believes there is something to drink in the fridge. Importantly, the laws are intended to provide causal explanations. According to the computational theory of mind, beliefs and desires are considered causally responsible for the observed behavior, which are embedded in mental processes that are computational processes in a symbolic system of mental

[38] Both terms are used interchangeably here and in the literature.
[39] For instance, the issue should be relevant and the logical relations should not be too complex.
[40] The reliable but non-universal nature of psychological laws presumably explains why the term is used interchangeably with the notion of a psychological generalization.

representations. Hence, psychological laws are not simply non-committal explanations that enable the rationalization of behavior, they are rather part of an explanatory project firmly committed to determining the actual causes of the observable behavior.

The crucial point then is that such laws apply to more than one subject, which means that a theorist needs to be able to attribute the same thoughts and beliefs to distinct subject. Hence, Aydede states:

> "When they are deployed successfully, these generalizations attribute the same propositional attitudes to agents. The agents' behavior is supposed to be explained/predicted by subsuming them under such generalizations. So propositional attitudes attributed to agents to explain/predict their behavior are required to be type-identical across them so they can be subsumed by such generalizations. The success of intentional explanation and prediction seems to depend on this fact."
> (Aydede 1999: 6)

In other words, if a psychological law connects a behavior B to a belief C, it means that an observation of behavior B can be explained by attributing the belief C to an agent. Accordingly, if distinct people are observed to display behavior B, the common behavior is explained by attributing the same belief C to both agents, which is to attribute to each of them a token of the belief type C. This clearly assumes that different people can have thought tokens of the same type. More precisely, the view is that law-like explanations of human behavior involve belief types, which are rendered true by the behavior of the respective tokens. As Aydede emphasizes, the success of psychological explanations depends on the fact that propositional attitude types can be attributed to distinct subjects, which amounts to the ability to adequately determine the type-identity of the token propositional attitudes across subjects. Specifically, a purported psychological law is true if what it states about the type is generally true of its tokens. Hence, it is necessary to determine which entities are tokens of the type and which are not, so as to properly identify the entities that speak to the truth of the law and distinguish them from entities that do not. Moreover, what is true for propositional attitudes is also true for the thoughts on which these propositional attitudes are based, as well as the concepts the thoughts contain as constituents. In fact, it is plausible to assume that thoughts can be shared because concepts can, and that beliefs and other propositional attitudes can be shared because thoughts can. As a result, the existence of law-like psychological explanations ultimately requires that concepts can be shared.

The upshot is that an adequate criterion for the type-identity of thought and concept tokens across subjects is crucial to account for both linguistic communication and the existence of law-like explanations of human cognition and behavior in the Language of Thought framework. Therefore, every proponent of the Language of Thought hypothesis needs to provide an account of how tokens are intersubjectively type-identified. Clearly, a possible way to avoid the need for a type-identity criterion is to reject the Language of Thought hypothesis altogether, and to offer an account of psychological explanations based on an alternative model such as Connectionism. In that case, the problem as stated does not arise[41]. This is acceptable, however, as the discussion takes the

[41] This is not to say, however, that there will not be an analogous problem. In fact, it seems as though the type-identity problem is even worse on the connectionist approach, as it apparently makes even intrasubjective type-identification a non-trivial problem (Shea 2007). Connectionism appears to have a substantial problem with the type-identity for its symbols throughout, but that of course does not change the fact that the problem will be different from the one stated here, and that the possible solutions will differ as well.

Language of Thought hypothesis for granted at this point. The resulting claim is conditional. If one accepts the Language of Thought hypothesis, then it is imperative to provide a proper criterion for the intersubjective type-identification of Language of Thought expression tokens[42].

A crucial question then is how the type-identity problem relates to Frege's Puzzle. The answer is perhaps already obvious at this point. Frege's Puzzle generally aims to show that there is more to the semantic content of a referring expression than its reference, as expressions such as proper names seem to differ in content even if are co-referential. As Aydede argues, Frege Cases for the Language of Thought illustrate the same point. They show that reference alone is not sufficient as a criterion for intersubjective type-identity, if else a (fictive) true law about Superman would be falsified by contrary beliefs about Clark Kent:

> "If Fodor is right about the Frege cases, it is a mystery how the folk could be so at ease and successful in their explanation. Certainly, there seem to be robust generalizations involving interpersonal Frege cases. For instance, people feel safer when they believe that Superman is present and act accordingly. State this generalization with 'Clark Kent,' it becomes false."
> (Aydede 1998: 293)[43].

One can suppose, for example, that it is a true (fictional) psychological law that people in danger will approach Superman for help, but not Clark Kent. The law will stipulate that if a subject believes to be in danger and if he or she believes that a person nearby is Superman, the subject will approach that person. This clearly requires that a theory is able to properly determine the range of concept tokens that speak to the truth of the law. Specifically, the proper range of beliefs for the law in question are those that involve SUPERMAN concept tokens, but not those that contain KENT tokens. Otherwise, the law about Superman will be falsified by beliefs about Kent. For example, the truth of the exemplary law would be contradicted by a subject who believes to be in danger but does not approach a person believed to be Clark Kent. Similarly, a generalization to the effect that everybody believes that Superman is the strongest person on the planet would be falsified by anybody who believes that Clark Kent is not the strongest person on the planet.

It is important to note that the fact that a fictive example is used is irrelevant for the main point. The reason is, firstly, that the same point can be made using real life examples, for instance with laws such as that everybody believes that Mark Twain is a famous author, which would be contradicted by a someone who does not believe that his neighbor Samuel Clemens is a famous author. The second, and more important reason, is that the truth of the purported law is in fact irrelevant. In the Superman example, the law that states that Superman is universally believed to be the strongest person on the planet could well be false, for instance because the main villain thinks to be stronger than Superman. The crucial point is that the law should not be falsified for the wrong reasons, for instance because somebody believes to be stronger than Clark Kent. The law about Superman should not be falsified because someone believes something about a person not believed to be Superman. The consequence of Frege Cases is thus that reference alone is not sufficient as a criterion for the type-identity of concepts across subjects. Based on reference alone,

[42] This reflects the conditional approach follows in the thesis. If one adopts the Language of Thought, then one has to adopt a Relationist semantics for it. This argument exclusively targets theorists who accept the Language of Thought hypothesis, explicitly or implicitly, but adopt a different semantic theory for it, for instance Fodor.

[43] See also (Margolis and Laurence 2007: 584). Aydede here makes the point that Fodor's syntactic solution to the Puzzle does not work. Fodor's solution is discussed later.

the concept tokens for Superman and Kent count as type-identical, which erroneously entails that beliefs to the effect that Kent does not have some property will contradict laws about beliefs that Superman does have that property.

The same is true for linguistic communication. If the successful communication consists in the transmission of identical thoughts, Frege Cases show that identical thoughts cannot be just co-referential thoughts[44]:

> "The publicity requirement [...] informs many standard accounts of communication as formation/expression of beliefs and desires through the exercise of the communication media."
> (Aydede 1999: 5)

The publicity requirement alluded to by Aydede here is Fodor's term for the idea that concepts and thoughts can be shared, in the sense that different people can have tokens of the same concept and thought types. Aydede's main point is that the idea of shared concepts and thoughts is crucial for the theory of linguistic communication if based on the Language of Thought hypothesis. Frege's Puzzle is a major concern in this regard as well. This becomes evident by imagining two Ancient Greeks having a conversation in which the speaker states that Hesperus is a star. Clearly, if the hearer forms the thought that Phosphorus is a star as a result of what the speaker said, he or she should not count as having properly understood the speaker. The linguistic communication between the speaker and the hearer is not successful in that case. However, if reference alone is used to type-identify thoughts, then the interaction will count as successful, as the thoughts will count as type-identical in virtue of being co-referential. Hence, if linguistic communication is understood as the transmission of thoughts, Frege Cases show that co-reference is not enough to type-identify thoughts.

The view that co-reference is not enough for successful communication is not just based on its intuitive plausibility. In a previous chapter, the thesis also mentioned an argument due to Macia (2004). In the example above, one can assume that the Ancient Greek speaker knows that Phosphorus is a planet, which the speaker aims to communicate to the hearer. The hearer, however, understands the interlocutor as speaking about Hesperus. The question is whether one can then consider the hearer to know, by testimony, that Hesperus is a planet. The obvious answer is no, even if the belief is in fact true and the speaker had knowledge of the belief held. The reason is clearly that the hearer lack justification for his or her belief about Hesperus. This can in turn be explained by the fact that the belief does not correspond to what the speaker said, given that the linguistic communication between them was unsuccessful. A theorist who endorses Referentialism, however, cannot offer this explanation. Therefore, a Referentialist either has to accept that there is knowledge on the part of the hearer, or explain why else the resulting belief lacks the justification required for knowledge by testimony. Neither option looks particularly promising, which means that Frege's Puzzle undermines the view that reference alone is sufficient as a criterion for the type-identification of co-referential Language of Thought expression tokens.

So how does Fodor perceive the difficulty posed by Frege's Puzzle for the type-identity of Language of Thought expressions? Although in his writings Fodor initially did not fully grasp the scope of

[44] As a reminder, the notion of co-referential thoughts is short-hand for thoughts that differ only in having a distinct but co-referential referring expressions, like the thought that Phosphorus is a star and the thought that Hesperus is a star. Speaking of co-referential thoughts is not supposed to suggest that thoughts are complex referential expressions.

the problem at the time of Pessin's publication, he subsequently acknowledged the general problem:

> "If there is a Frege problem, it must be about how to draw the type/token relation for (syntactically) primitive concepts."
> (Fodor 2008: 75)

Fodor makes this observation as a result of his strategy to "nibbl[e] away at the intuitions that Frege's arguments for senses rest on" without conceding the point to Frege that a semantic theory requires senses (Fodor 2008: 16). Fodor's basic idea is to argue that complex concepts such as THE MORNING STAR and THE EVENING STAR can be individuated by their constituent structure (and the fact that MORNING and EVENING are not co-referential), but Fodor is of course aware that this strategy still requires a solution for the type-identity problem for the basic concepts that lack constituent structure. At this point, Fodor is also aware that there is a problem specifically about the criterion for intersubjective type-identity:

> "what becomes of the identity conditions for primitive concepts when more than one mind is involved?"
> (Fodor 2008: 89)

In his latest contribution on the Language of Thought hypothesis, Fodor is thus aware that Frege's Puzzle affects the Language of Thought as a problem for the type-identity of basic referential expressions[45]. Fodor is also aware of the importance of an adequate type/token distinction for Language of Thought expressions. As Aydede, who argues that the Language of Thought hypothesis is predicated essentially on the idea that people share beliefs if they each have a token of the same type, Fodor maintains:

> "Since, according to RTM, concepts are symbols, they are presumed to satisfy a type/token relation; to say that two people share a concept (i.e. that they have literally the same concept) is thus to say that they have tokens of literally the same concept type."
> (Fodor 1998: 28)

Fodor in fact even uses the type/token distinction to reject Frege's argument that thoughts must be non-mental because they are objective, by which Frege means that different thinkers can have the same thought (1998: 20-21). Fodor rejects this idea as it would entail that concepts, the constituents of thought, cannot be mental representations. Fodor's point against Frege is described as follows by Laurence and Margolis:

> "Frege's own case against mental representations is especially disappointing. The initial rejection is based on the claim that people can't literally share mental representations because mental representations figure in conscious subjective experience and hence are unique to the minds in which they occur. [...] The main problem with the argument, however, is that its plausibility turns on a type-token confusion. Frege is certainly right that each person has her own unique mental representation tokens, but the question is whether different tokens in different minds can be of the same type, and we see no reason why they can't be. The situation is, in principle, no different than it would be had Frege argued that two people can't literally utter the same sentence. While it's true that each will produce her own token, that doesn't mean that the utterances can't be

[45] Fodor's answer to the problem is presented in the next section.

> instances of the same sentence type, for example, both instances of the sentence "snow is white".
> (Margolis and Laurence 2007: 567)

This shows that Fodor is aware that something needs to be said about which concept tokens count as being type-identical, as well as why. The criterion for type-identity is evidently important, as it is not sufficient simply to provide a list of tokens that belong to each type. The proposed account should also say why a certain token belongs to a given type[46]. As regards Frege's Puzzle, the account should specifically explain why all SUPERMAN tokens count as being of the same type, while all KENT tokens count as being of a different type. It is thus no surprise that Fodor immediately grasped the substantial difficulty his Referentialist approach to the Language of Thought faces once pointed out to him:

> "Fodor himself admits that "the whole [LOT] project collapses unless some coherent account of [...] type identity can be provided" (personal communication)."
> (Pessin 1995: 33)

Hence, Fodor realizes that if reference alone is not sufficient as a criterion for intersubjective type-identity, and he fails to provide a viable alternative to solve the problem, the Language of Thought hypothesis is, by his own account, in major trouble. The next chapter will show that this is precisely the situation Fodor is in. However, the thesis will argue subsequently that the problem is not Fodor's Language of Thought hypothesis, as Pessin for instance maintains, but his commitment to Referentialism (Pessin 1995: 51). The result is that the Referentialist semantics Fodor endorses is not adequate as a theory of content for the Language of Thought. As Fregeanism turns out to be problematic as well, for reasons partly highlighted by Fodor himself, this motivates the main claim of this thesis, namely that only Semantic Relationism is adequate as a theory of content for Language of Thought, with the consequence that a proponent of the Language of Thought hypothesis has to adopt a Relationist approach to its semantic content.

Before considering the connectionist alternative in the next section, a few final remarks. First, another short note on the metaphysical status of types. The proposal intends to remain largely neutral in this respect, availing itself of an intuitive understanding of types as they can be distinguished from tokens on the basis of everyday examples in natural language. As mentioned, a sentence such as "John sees John" contains three expression tokens (two for John and one for the relation of seeing), but only two expression types (one for John and one for seeing). That has to suffice to motivate the existence of types, without any further commitment in terms of what objects they are, when and how they exist, and so on. The only commitment is that types are abstract objects, in contrast to their tokens, which are concrete particulars with a specific spatio-temporal location[47]. This partial determination of the metaphysics of types is sufficient for the purpose of the thesis as its focus is not on the types as such but their relation to tokens, in the sense that it seeks to establish when and why Language of Thought expression tokens count as being of a certain type. For that reason, the metaphysical status of types is also irrelevant for the comparison between the current proposal and the alternatives in the literature, which are also based on an

[46] In view of a similar proposal in a different domain, Field makes the point as follows: "What the set-theoretic account does is to ignore the question of the property altogether, and to focus instead on the set of things that have that property." (Field 1978: 11).

[47] For further discussion on the metaphysical nature of types, see Wetzel (2009, 2011).

intuitive understanding of types. Moreover, even if an alternative account adopts a more specific proposal on the nature of types, it should always be possible to include the same conception in the current proposal.

A second remark concerns Fodor's publicity constraint. It was mentioned that Fodor discusses the type-identity problem as a problem about the publicity of concepts, which, in Fodor's words, is the "the dead certainty [...] that lots of concepts are shared by lots of people." (Fodor 2004: 35). Concepts are public according to Fodor in the sense that different people have to be able to possess the same concepts, which is to say that they have to be able to have tokens of the same concept type. Fodor raises this point against Semantic Holism, which is the idea that content of a concept is determined by its relation to other concepts, as given by the beliefs of the possessor of the concept. For someone who believes that dogs are agreeable, for instance, the relation to AGREEABLE will be part of the content of the concept DOG. Fodor argues that in order to avoid an untenable commitment to an analytic-synthetic distinction, Semantic Holism is committed to the view that all beliefs in which a concept occurs are determinative of its content. The major problem is that since no two people ever share all their beliefs, it follows that none of their concepts will ever have the same content. Fodor concludes that Semantic Holism about conceptual content violates the publicity constraint, which is another way of saying that semantic content as defined by Semantic Holism is not adequate as a criterion for the type-identity of Language of Thought expression tokens.

Fodor also argues that concepts must be identical across subjects, and not just similar. Fodor motivates this by a kind of regress argument against the similarity approach (1998: 30-31). According to Fodor, a similarity approach maintains that the concept tokens of two people are type-identical if they have a similar content, which a holistic semantic theory can allow for in case people share many but not all of their beliefs involving the concept. For example, they might share the belief that dogs are animals, while disagreeing in their belief that dogs are agreeable. Fodor, however, objects that this view presupposes the sameness of the concepts ANIMAL and AGREEABLE, and hence falls prey to an infinite regress. It is not entirely clear, however, why the Semantic Holist cannot appeal to a global notion of similarity, based on which two concepts will count as the same whenever they represent the closest match within the respective belief systems. The underlying idea is simply to find the best possible way to align two belief systems in their entirety. If so, the regress Fodor points out looks unproblematic, and so Fodor's argument does not appear all that convincing. Even so, the holistic approach is problematic, but for a different reason. The main problem of the view is not the regress, but rather the fact that it theoretically excludes the possibility of having inverted beliefs. On the holistic view, it will not be possible for a person A to believe everything about P that B believes about Q and vice versa, since then A's concept for P will be identified with B's concept for Q and vice versa. The possibility of having inverted beliefs is thus excluded as a matter of theoretical principle. This possibility should not be principally excluded, however, as it seems perfectly possible for people to have inverted beliefs as a matter of empirical fact. In other words, Semantic Holism is problematic because it theoretically excludes what appears to be a genuine empirical possibility[48].

As a final caveat, it should be reemphasized that the issue raised by indexicals is largely ignored

[48] This issue will reemerge later in the context of the attempts to defend Fregeanism in view of Kripke Cases, as sense-identity is a transitive relation, but sense-similarity is not.

in the remainder of the thesis. If a person thinks "I am crazy" and someone else thinks about that person something he or she would express to that person by saying "You are crazy", do they then believe exactly the same thing or not? To begin with, it should be reiterated that on the present view, only thoughts have semantic content, but they do not contain indexicals. In other words, thoughts can be said to be indexical only in the sense that they underlie the use of indexical expressions in natural language[49]. More specifically, on the proposed view linguistic indexicals have to be replaced by non-indexical singular concepts in thought. As a result, there is no question regarding the sameness of semantic content for complex expressions containing indexicals. Even so, there is evidently an analogous question about the sameness of content for the thoughts that underlie the use of indexicals in natural language, which is especially important in view of the fact that the identity of thoughts is fundamental as a criterion for successful linguistic communication, which can evidently make use of indexicals. Unfortunately, it goes beyond the scope of the thesis to develop a comprehensive response to this concern. However, it was at least indicated how the problem might in principle be addressed, namely by either loosening the conditions for successful communication in the case of indexicals or, perhaps more promisingly, by loosening the conditions on content identity in the case of concepts insofar as they underlie the use of indexicals.

This section can be concluded by reiterating that the type/token distinction is fundamental for the Language of Thought hypothesis in view of communication and psychological explanation. Hence, the Language of Thought hypothesis requires a criterion that allows for the proper type-identification of Language of Thought expression tokens across subjects, and Frege's Puzzle for the Language of Thought shows that reference alone is not sufficient for this purpose. An interesting corollary of this is that a longstanding philosophical problem, namely Frege's Puzzle, turns out to be highly relevant for contemporary research in cognitive science. Moreover, it also shows that what was initially considered a purely linguistic problem is in fact relevant beyond the philosophy of language, namely for the philosophy of mind, and even beyond philosophy altogether, namely for linguistics, psychology as well as cognitive science. The upshot is that if the Language of Thought lacks a theory of content that is adequate to support the type-identification of its expression tokens, the hypothesis is not available as a foundational theory for research in the philosophy of mind, cognitive science and linguistics. By implication, this lends support to alternatives such as Connectionism. While most connectionists are motivated by the empirical evidence about the structure of the brain, at least one proponent of the approach in fact argues in favor of Connectionism on the basis that the type-identity problem undermines the Language of Thought hypothesis:

> "In dropping symbol manipulation, [...] Connectionism doesn't need to address the issue of syntactic type individuation which cripples the classical computational theory of mind."
> (Pessin 1995: 51)

This thesis in fact supports Pessin's view that no proposal in the literature has so far been successful in this regard, including Fodor's own. Even so, the ultimate goal is to show that the Language of Thought hypothesis can be saved by means of the Relationist semantics developed by Fine, and only that way (Fine 2009). If correct, this entails that any philosopher of mind, linguist or cognitive scientist who makes use of the Language of Thought as a foundation for research, be it explicitly or

[49] Put differently, an indexical thought is shorthand for a non-indexical thought that represents the interpretation of a indexical natural language sentence.

implicitly, will be committed to the view that semantic content is relational in the sense defined by Semantic Relationism. Before making that case, however, a brief discussion of the main competitor of the Language of Thought hypothesis.

3.6 Connectionism

The aim in this section is to briefly consider the major competitor to the Language of Thought hypothesis, Connectionism, in view of two main questions. First, is Connectionism a viable alternative to explain the mental capacities required for linguistic competence? Secondly, what is the consequence for the overall proposal of this thesis if Connectionism is true?

With regard to the debate between the Language of Thought and Connectionism, it should be clear that not nearly enough can be said here to settle what is in effect a major ongoing debate in the philosophy of mind and cognitive science. As a result, the thesis effectively simply assumes that the Language of Thought hypothesis is correct, to then argue that Semantic Relationism is indispensable as theory of its content. It will nonetheless be valuable to say something about why the Language of Thought hypothesis remains a good candidate when it comes to explaining the mental capacities responsible for linguistic competence, and to suggest under which circumstances a Relationist semantics will remain applicable as a theory of mental content even if Connectionism is correct. That said, it remains a live possibility that an approach to the mind is correct that is radically different from what the Language of Thought hypothesis assumes, thus undermining most and perhaps even all the usefulness of the results presented in this thesis. This, however, is nothing more than the standard risk incurred by all research that is empirically informed, which is true for the Language of Thought hypothesis in general, and obviously for a specific proposal regarding its content as well (Fodor 1998: 5)[50].

The main hallmark of Connectionism is a non-linguistic approach to mental cognition:

> "While classical computationalists explain cognition by reference to linguistic structures, connectionists explain cognition in terms of neural networks."
> (Piccinini 2009: 7)

Instead of linguistic strings, computations are performed within networks that consist of nodes and connections between them that can vary in strength:

> "Neural networks are simplified models of the brain composed of large numbers of units (the analogs of neurons) together with weights that measure the strength of connections between the units."
> (Garson 2010)

[50] Perhaps not all philosophical research is as easily prone to empirical falsification, but it cannot be a good reaction at this point to avoid philosophical inquiry into all topics that are based substantially on empirical assumptions. The alternative in this case is to argue for a semantic theory no matter what is true about the mind. That, however, is a dubious strategy, in that it assumes that one can develop and defend a theory of mental content independent of knowing how the mind actually works as a matter of empirical fact. More precisely, the assumption would be that one can develop a semantic theory and determine its truth without any commitment to what the theory is actually about. The present view is based on the assumption that it makes more sense to develop a semantic theory with a commitment that it is a theory of content for syntactically structured mental representations, even if this carries the risk of empirical falsification, than to hope that one can gain substantial semantic insights by avoiding empirical assumptions about the mind altogether.

Accordingly, Connectionism provides a possible alternative account for mental processes:

> "Philosophers have become interested in Connectionism because it promises to provide an alternative to the classical theory of the mind: the widely held view that the mind is something akin to a digital computer processing a symbolic language."
> (Garson 2010)

The major aim in this section is not to provide a detailed account of Connectionism, nor to discuss how the various Connectionist models differ[51]. The focus is instead on the main point of disagreement between Connectionism and the Language of Thought hypothesis. The objective is to get an understanding of how computations are understood in Connectionism in order to determine, first, whether it represents a viable model for the mental capacities underlying linguistic competence, and secondly, how a semantic theory fits into the picture if it is a viable model.

3.6.1 A Viable Alternative?

The discussion in this section is based mainly on a paper by Van Gelder on the ability of Connectionism to account for semantic compositionality, which is something both parties to the debate agree is necessary for cognition (Van Gelder 2006: 482). Although there is vast amount of alternative literature on the topic, Van Gelder's contribution has the advantage that it is recent, sympathetic to Connectionism and yet outspoken about the limitations of its explanatory power. To begin with, it is important to understand that Connectionism is a concern in this thesis only to the extent that it represents a real alternative to the Language of Thought hypothesis, and is not just a complementary theory about the nature of mental processes. Connectionism is thus of interest only insofar as its truth undermines the truth of the Language of Thought hypothesis. There are in fact two ways in which Connectionism can be complementary to the Language of Thought hypothesis. Connectionism can serve either as a possible theory about the implementation of a Language of Thought, or it can be true for parts of the minds that are not involved in linguistic competence. The first case refers to what is called implementational Connectionism:

> "[M]any connectionists do not view their work as a challenge to classicism and some overtly support the classical picture. So-called implementational connectionists seek an accommodation between the two paradigms. They hold that the brain's net implements a symbolic processor. True, the mind is a neural net; but it is also a symbolic processor at a higher and more abstract level of description. So the role for connectionist research according to the implementationalist is to discover how the machinery needed for symbolic processing can be forged from neural network materials, so that classical processing can be reduced to the neural network account."
> (Garson 2010)[52]

In the case of implementational Connectionism, the Language of Thought hypothesis remains true even if Connectionism is true as well. The second case in which Connectionism can be true in a non-threatening way is if the Language of Thought hypothesis is true for some mental processes,

[51] A detailed discussion on Connectionism from a philosophical perspective can be found in Ramsey (1990), Chalmers (1993), Aydede (1995), Pessin (1995), Fodor (1997), Garfield (1997), Van Gelder (2006), Shea (2007), Slezak (2009), Gallistel and King (2009), Piccinini (2009) and Garson (2010).

[52] Aydede (1995) and Van Gelder (2006) make similar points.

and Connectionism for others. This would constitute a horizontal, or side by side, accommodation between Connectionism and the Language of Thought hypothesis, rather than a vertical one, where the connectionist system realizes a classical architecture. That outcome is acceptable for current purposes as long as linguistic capacities are within the domain governed by the Language of Thought hypothesis. Even if this is not a conceptual necessity, it is arguably plausible to assume that if the Language of Thought is true about some part of the mind, this will include the part responsible for linguistic competence, given how parallel natural languages and the Language of Thought are. At any rate, in either of these cases the Language of Thought hypothesis remains true to the extent necessary for the applicability of the results presented in this thesis.

As a digression, a brief note on the fact that many theorists intuitively seem to think that only Connectionism is at all empirically plausible as a theory about mental processes, given what is already known about the brain, that is, the fact that it is constituted by myriads of neurons connected by synapses. First of all, the fact that connectionist networks can implement a Language of Thought-based architecture shows that the matter between Connectionism and the Language of Thought hypothesis is not a simple matter of intuition or empirical observation about how the brain is constituted. Secondly, the major challenge proponents of the classical Language of Thought based approach to the mind, such as Fodor, have raised for Connectionism is an argument to the effect that the theory is principle unable to explain the capacities the mind is empirically known to have. If the theory cannot account for the observed mental capacities, however, then it cannot be true, no matter how plausible it may otherwise seem. Gallistel and King make a similar point:

> "The neuroscience literature contains many conjectures about how the brain computes, but none is well established. Unfortunately, computer scientists sometimes forget what they know about the foundations of physically realizable computation when they begin to think about brains. This is particularly true within the neural network or connectionist modeling framework. The work done in that tradition pays too much attention to neuroscientific speculations about the neural mechanisms that supposedly mediate computation and not enough to well-established results in theoretical and practical computer science concerning the architecture required in a powerful computing machine, whether instantiated with silicone chips or with neurons. Connectionists draw their computational conclusions from architectural commitments, whereas computationalists draw their architectural conclusions from their computational commitments."
> (Gallistel and King 2009: ix)

The main point is that it has to be shown that Connectionism has the resources to account for computational processes that the mind is known to perform, if else it cannot be viable as a theory of the mind, no matter how plausible it is otherwise. This means that the real question about Connectionism is a highly theoretical one, namely whether a non-implementational version of Connectionism has the resources to account for the known computational capacities of minds. Obviously, this question cannot be answered by intuition alone, nor can it be settled by simply pointing to the physical structure of the brain.

The generally accepted view in the literature is that the main difference between Connectionism and the classical Language of Thought approach concerns the structure of complex representations. This in turn depends on the process by which complex representations are generated, which in the

classical approach is the process of concatenation (Van Gelder 2006: 486)[53]. Leaving aside many important details, the crucial point is that in the classical approach, simple representations enter into complex representations by virtue of being put together in a certain way, that is, by being concatenated into complex structures. Simple representations therefore remain apparent in the complex expressions (Van Gelder 2006: 486). As a result, in the classical approach, complex representations are such that it is immediately obvious what their constituents are, much like it is immediately obvious what words a natural language sentence contains. This parallel is of course not accidental, as natural language sentences are largely composed by concatenating words is a specific order as well. In computational terms, this entails that the constituents of complex expressions are directly computationally accessible. Hence, computational processes can be defined over complex expressions in virtue of the constituents they contain, since it is immediately obvious which these constituents are. For instance, a complex expression such as "P&Q" can immediately be determined to allow for the inference of "P", since it obviously contains "P" as a constituent. In stark contrast, Connectionism operates with non-concatenative complex representations, which entails that their constituency structure is opaque. Complex representations in Connectionism are therefore called distributed representations, since the properties of the simple expressions are, so to speak, distributed over the entirety of the complex expression.

To make this fundamental difference clear, Van Gelder compares complex connectionist structures to Gödel numbers, a comparison adopted here in a modified way (Van Gelder 2006: 488). The key feature of Gödel numbers is that while they are also uniquely determined by their "constituents", they do not contain them in any obvious way[54]. In order to understand the classical concatenative approach, one can take the way numbers are represented as base ten exponentials (10^x) as an example. In the classical numerical system, a number, say, 135, which consists of 5 times base ten with exponent 0, 3 times the base ten with exponent 1, and so on, which is to say that it amounts to $(1 * 10^2) + (3 * 10^1) + (5 * 10^0)$, is represented as "135", a concatenated sequence of "1", "3" and "5". So "135" contains the numerals "1", "3" and "5" as obvious constituents, and it concatenates them in a specific order that shows the exponent of the number ten with which it is multiplied. For instance, the fact that the numeral "3" occurs in the second position from the right means that it has to be multiplied by 10 with the exponent 1 (as the rightmost position stands for 0). The crucial point is that a complex numeral such as "135" makes it immediately obvious how many hundreds, tens and ones the represented number contains. Hence, even for very complex (viz. long) numerals, it only takes a second to determine how many tens or hundreds it contains. For instance, the numeral "39563420" represents a number for which is is immediately obvious that it contains two tens and four hundreds. Each numeral and its position are straightforwardly accessible, and they fully determine what the exponent of the the base ten is and how often it has to be added.

A Gödel alternative to this numerical system would be to represent numbers not as the sum of base ten exponentials, but as the product of increasing prime numbers. For instance, the number 135 would be $5^1 * 3^3 * 2^5$, and hence be represented (classically) as "4320". In this numerical system, the ones are entered as the exponent of the prime number 2, the tens are entered as the exponent of the prime number 3, and so on, using increasing prime numbers. An essential feature of this system is that the fundamental theorem of arithmetic, which is also called the unique prime factorization theorem, establishes that the resulting number, and hence the classical numeral that

[53] For a rare dissenting view on the role of concatenation, see Aydede (1995).
[54] "Determinant" is thus arguably a better term than "constituent".

represents it, will always be unique. This means that every number has at least and at most one prime factorization[55]. Accordingly, a Gödel numeral represents a unique Gödel number, which in turn represents exactly one "normal" number. Hence, "4320" will unambiguously represent 135 in this system. This alternative number system is thus effectively based on a Gödel transformation of a number, the result of which is then represented by a classical numeral.

While both the classical and the Gödel-style numerals are adequate in that they both offer unique ways of writing a number, the crucial difference is that the Gödel-numeral does not make its constituents obvious. Although "4320" uniquely represents the number 135, one cannot easily tell this from looking at the numeral. It is not trivial to determine what prime factors it contains, and what exponents they have. Instead, it has to be computed. Accordingly, a long numeral such as "39563420" will represent a unique number in the Gödel system, just like in the classical system, the difference is that it is no longer trivial to determine what number it is. With the Gödel system, it is no longer obvious how many tens and hundreds the number contains, that is, what exponents the prime numbers 3 and 5 have, even if there is a unique answer[56]. In fact, if the numeral is long enough, it actually becomes computationally infeasible to calculate the prime factors, which is why this type of encoding first developed by Gödel is used for modern techniques of data encryption.

As a result, in the Gödel system, which represents the connectionist approach to complex representations, the constituents of a complex expression cannot be read off the the complex expression. Complex representations in the Connectionism model do not contain their constituents or determinants in the apparent way that complex Language of Thought expression strings do. Hence, in order to determine the basic constituents of a complex connectionist representation, they have to be either "computed back", or as an alternative, they have to be always co-instantiated[57]. The latter idea is that complex representations are instantiated in parallel with their basic determinants in order to make the latter computationally accessible. This is in fact an option envisaged by some connectionist to avoid the problems that result from distributed complex representations, most notably regarding the systematicity of thought. The problem with this view, however, is that one not only needs the basic determinants, one also has to know their role or position in the complex expression. For instance, it is only possible to deduce that John does something from the complex thought that John greets Mary if is known not only that the thought is about John, but also that John is the agent, which means that "John" appears as the subject in the complex thought. Hence, the suggested approach only works if it assumes the co-instantiation of both the basic constituents and sufficient information about their structural position. Arguably, this version of Connectionism would have non-concatenative compositionality in virtue of parallel processing. Any complex representation would always be instantiated at the same time as its compositional constituents, without the constituents being literally parts of the complex whole, however, unlike on the classical Language of Thought based approach. Even so, it is reasonable to argue that such a version of Connectionism in fact amounts to an implementational version that is best described by a classical architecture. Unfortunately, Fodor actually defines constituency structure in the classical account as a metaphysically necessary co-tokening relation (Fodor 1997: 111). Parallel processing offers co-tokening without metaphysical necessity, however, and therefore it does not count as classical by Fodor's definition. Since such a system is clearly best described as a classical architecture, however,

[55] It is the number itself if the number is prime, of course.
[56] The answer, a computer tells, is zero tens and one hundred: the factors are $2^2 * 3^0 * 5^1 * x$.
[57] In this case again, "constituent" might not be the best term, as "determinant" might be more adequate.

it is preferable to loosen the necessity requirement in the definition of a classical architecture so as to count the parallel processing option as an interesting implementational realization of a classical architecture. Reaching a similar conclusion, Van Gelder states:

> "A second and more radical approach is to devise models in which structure-sensitive processes operate on the compound representations themselves without first stopping to extract the basic constituents."
> (Van Gelder 2006: 506)

The real connectionist alternative option is therefore to define computations on complex representations without proceeding through their basic constituents. The main concern then is whether this approach provides enough computational power to account for known mental capacities. This in fact breaks down into two questions. First of all, there is a question whether Connectionism can in principle explain known mental capacities, that is, the basic operations the computational mind performs. The answer to this is yes, according to Van Gelder (2006: 507). Garson makes a similar observation:

> "Experiments on models of this kind have demonstrated an ability to learn such skills as face recognition, reading, and the detection of simple grammatical structure."
> (Garson 2010)

A second question, though, is whether the explanation the connectionist model offers for simple operations can be suitably "scaled" (Gallistel and King 2009: 270). The issue is whether the same operations can reasonably be assumed to be in effect for more complex tasks. A simple example will make the issue clear. If a person has to learn, say, twenty sentences of Chinese, a viable option is to make a list of all the sentences with their English translations. In this sense, a list is in principle able to account for a person's limited linguistic knowledge of Chinese. If a person has to learn fifty million Chinese sentences, however, it is no longer an option to do it with a list. Instead, the person will have no choice but to learn the vocabulary and the syntactic rules that generate the sentences. For the more complex task, a list is thus no longer a viable option. In other words, learning a language by virtue of a list does not scale. Therefore, a list of translations cannot reasonably be assumed to underlie the linguistic capacities of bilingual speakers, even if it can explain very limited bilingual capacities. The analogous worry Gallistel and King have is that connectionist networks can explain basic mental operations, but not in a way that is suitably scalable (2009: 277).

The major problem Gallistel and King raise for Connectionism is memory (2009: xv). While memory can in principle be explained in a connectionist network, one problem is that it is done in a way that does not take into account the fact that people can memorize things based on a single experience. The reason is that in the connectionist architecture, memory is achieved through the strengthening of connections, a process that is not instantaneous. More importantly, memory is also computationally very costly to sustain on this view, as it is based on "reverberatory loops" that are computationally highly inefficient (Gallistel and King 2009: xv, 259). In contrast, the classical approach assumes that information can be memorized by virtue of a write operation in a symbolic representational system, which is highly efficient from both a computational and a temporal point of view, and so easily explains the mental capacity of memory. Hence, Gallistel and King do not doubt the claim that Connectionism can explain memory per se, but rather point out that it explains it in a way that is implausible as a model for the large scale storage of information

in the mind. According to Gallistel and King, the problem with memory in connectionist models is in fact based on a deeper problem:

> "What we now emphasize, however, are the deeper problems in these models, the problems that stem directly from their avoiding recourse to a read/write memory. We call these the deeper problems because we believe they are inescapable; they grow directly out of the assumption that brains do not have a read/write memory."
> (Gallistel and King 2009: 276)

The only option Gallistel and King see for connectionist models to account for complex mental processes, including the storage of information, is to assume distributed representations in the sense explained earlier. The problem with distributed representations is that they are not transparent:

> "The problem is the unintelligibility of the distributed representation. The values thus represented are not accessible to computation."
> (Gallistel and King 2009: 284)

While connectionist models in principle allow for memory by means of distributed representations, they do so in a way that is computationally ineffective and hence does not scale:

> "As has been pointed out by others [...], the great weakness of neural network models is their inability to offer a generally effective solution to the problem of compositionality. In our terms, the problem is their inability to provide compact procedures that implement functions of two arguments without pre-specification of the possible arguments. As we have attempted to show, this problem appears over and over again when one contemplates contemporary neural network models"
> (Gallistel and King 2009: 286)

As the number example indicated, complex distributed are uniquely derived from simple determinants, but the system has no access to which these are. So the problem with complex representations in the connectionist approach is the lack of computational accessibility of the "computed" values (Fodor 1997). Gallistel and King argue that this is in fact often overlooked by connectionists:

> "Modelers do not always distinguish between their own ability to determine different states of the world by examining the state of the network (which neurons are active and which are not) and the question of whether the information the modeler gleans from the different states of the network is physically efficacious within computational operations relevant to the supposedly represented system, and, if so, how."
> (Gallistel and King 2009: 84)

In computational terms, this means that the necessary processes have to be defined for all complex expressions individually, since they cannot be determined from their structure:

> "Contemporary connectionist thinking is predicated on this same assumption: it's all axonal and synaptic conduction. In computational terminology: it's all look-up tables."
> (Gallistel and King 2009: 128)

So instead of having a procedure to concatenate simple expressions into complex expressions that can then be read in a systematic way, the computational account in Connectionism is necessarily based on lists or look-up tables for all complex expressions. Hence, all complex value have to

be stored independently, which does not scale for many mental capacities, including linguistic competence, which consists in the ability to understand an infinite number of complex natural language strings. To scale, mental computation requires compact symbols and procedures:

> "We make a critical distinction between procedures implemented by means of look-up tables and what we call compact procedures. The essence of the distinction is that the specification of the physical structure of a look-up table requires more information than will ever be extracted by the use of that table. By contrast, the information required to specify the structure of a mechanism that implements a compact procedure may be hundreds of orders of magnitude less than the information that can be extracted using that mechanism."
> (Gallistel and King 2009: xi)

The basic point is that a list or look-up table always has to be as big as the inputs for which it provides a value, which is not the case for compact procedures. A list increases linearly in size with the number of inputs for which it specifies a value, while with a compact procedure the possible inputs increase exponentially in size with regard to the specifications of the procedure. In fact, a procedure with finite specifications can even provide a value for a potentially infinite amount of inputs, as is the case for semantic compositionality. It is clear, however, that linguistic competence is based on the representation a finite list of basic vocabulary and a finite list of rules, which together are sufficient to derive an interpretation for an infinite amount of syntactically well-built strings. The non-scalable alternative is to have a look-up table with each possible string and its interpretation. As explained, this is possible for very limited sets of sentences, but it is unrealistic as a model for linguistic competence in view of the known linguistic capacities of the mind. In short, the problem for Connectionism is that the look-up tables necessary to account for the mental capacities underlying linguistic competence are too big to be a realistic model.

According to Gallistel and King, Connectionism fails to deal with what they call the infinity of the possible, as it lacks compact symbols and procedures, which is why the procedures it assumes to explain mental capacities are computationally not sufficiently efficient. As is well-known, this worry it is largely shared by Fodor (Fodor 1997). Crucially, this entails that the fact that it has been shown that connectionist models can successfully parse "simple grammatical structure", as Garson points out, is not all that significant, as it does not address the main concern about scalability (Garson 2010). In defense of Connectionism, Van Gelder similarly argues that because initial results are promising, one should expect remaining problems to be ultimately solvable:

> "Connectionists models employing such [distributed] representations can, at least for the moment, be taken seriously as candidates for the explanation of cognition while nevertheless remaining quite distinct from the Classical approach."
> (Van Gelder 2006: 510)

As the last part of the quote shows, the claim Van Gelder makes is that non-implementational versions of Connectionism have to be considered viable alternatives to explain mental capacities that require computation. However, Van Gelder does not offer the slightest indication as to how the scalability problem can be solved. Van Gelder in fact maintains that this is an empirical matter:

> "Whether such initial explorations can in fact be developed into comprehensive accounts of systematic cognitive processing is a matter for further investigation (which is just

> another way of pointing out that the disagreement between the Classicalist and the Connectionist, construed this way, is a straightforwardly empirical one)."
> (Van Gelder 2006: 507)

The explanatory potential of Connectionism, however, is not an empirical matter in this sense. The actual empirical issue is which of the two models, assuming that both are explanatorily adequate, is empirically correct, that is, which of the two possible models actually describes reality. However, Van Gelder fails to show that Connectionism is explanatorily adequate for large-scale mental capacities. To be sure, neither has the proponent of the classical approach shown the opposite, as Gallistel and King admit, but such negative claims are notoriously hard to establish (2009: 285). It is thus fair to conclude that Van Gelder overstates the case for Connectionism. He moves from the legitimate conclusion that Connectionism is possibly a possible model to the stronger but unjustified conclusion that Connectionism is a possible model of the mind. The correct conclusion is that to date it remains an epistemological possibility that Connectionism is a metaphysical possibility regarding the structure and functioning of the mind. In other words, it is as of yet not known that Connectionism it is not a metaphysically possible model of the mind, which is weaker than Van Gelder's claim that it is known to be a metaphysically possible model of the mind.

On the other hand, Gallistel and King arguably overstate their case against Connectionism as well. They use the aforementioned encryption techniques to argue that it is impossible to handle distributed representations in a computationally effective way (2009: 284). That point is too strong, however. It is true that some encoding schemes, like the ones used for data protection, are computationally so demanding that they are virtually impossible to decode in a computationally effective way. Such schemes are based on functions that are effectively if not theoretically one-way functions, given the immense computational complexity necessary in the decoding direction. However, it is obvious that such encoding techniques are specifically designed to be so complex that they are impossible to decode effectively without the appropriate key. Evidently, the same need not be true for simpler Gödel-type encryption schemes, which would distributed representations that are computationally efficient to a certain if not a maximal degree, without relying on classical concatenation and constituency structure. Admittedly, it is not clear whether such schemes are possible, but Gallistel and King do not provide any evidence to the contrary either. As a result, it is reasonable to reject Gallistel and King's stronger claim and uphold the view that it remains epistemologically possible that Connectionism provides an adequate model of the mind that is possibly empirically adequate as well.

As a result, the thesis cannot rely on a definitive judgment about the viability of Connectionism as an alternative to the Language of Thought hypothesis. It cannot be definitely ascertained at this point whether Connectionism offers a more plausible approach to the mind than the Language of Thought hypothesis all things considered. However, it has been pointed out that the neural composition of the brain does not speak against the Language of Thought hypothesis, and that there remain serious doubts about the explanatory power of Connectionism, especially in terms of semantic compositionality, which is crucial for linguistic competence. At the very least, this means that the Language of Thought hypothesis remains a plausible candidate to understand and explain cognition, assuming, that is, that the type-identity problem for Language of Thought expression tokens can be solved. Before addressing this problem by means of a Relationist semantics, first some remarks about the status of Semantic Relationism if Connectionism turns out to be true.

3.6.2 Connectionism and Semantic Relationism

Even if Connectionism is true, it does not immediately follow that the proposed semantic solution to the type-identity problem for the Language of Thought expressions is futile. It in fact depends on two things. First, whether the same problem arises in a connectionist framework. Secondly, if that is the case, whether it is possible to apply the proposed solution in a connectionist framework as well. Pessin's earlier statement notwithstanding, there is prima facie no reason to suppose that Connectionism will be free of the problems that affect the Language of Thought hypothesis in this regard. For instance, even if thoughts are distributed representations, they still have to be properly typed across subjects in order to account for psychological laws and linguistic communication. As a result, the viability of the solution defended in this thesis will depend on its applicability, which in turn depends on the possibility of defining suitable vehicles of representation in Connectionism. As explained, this would be the case if implementational Connectionism is true, for instance. It would also be true, however, if suitable vehicles are identifiable in non-implementational connectionist models. Shea argues that it is possible to define such vehicles of content in Connectionism:

> "The proposal is that the vehicles of content in some connectionist systems are clusters in the state space of a hidden layer. Attributing content to such vehicles is required [...]"
> (Shea 2007: 246)

This is evidently not mentioned in defense of Connectionism. Even if Shea is right, the ability to identify vehicles of content in Connectionism does not amount to an answer to the concerns discusses earlier, although it is possible that it can help towards developing a suitable response. The point is rather that under certain conditions, the proposed Relationist solution to the type-identity problem for the Language of Thought can be used even in a connectionist framework. More specifically, if suitable vehicles can be identified in connectionist networks, then these vehicles can be taken to refer and stand in coordination relations, in which case the proposed solution remains applicable. It is only if there is no sense in which connectionist networks have discrete vehicles of semantic content that the current proposal is no longer available to type vehicles of content. Having said that, the thesis proceeds henceforth from the assumption that the Language of Thought hypothesis is true, or at least something close enough to it with suitable vehicles of semantic content. This assumption is evidently based on an empirical thesis about mental cognition, which is plausible as well as justifiable, but it remains an empirical hypothesis that is potentially false.

Moreover, the thesis does not say much about the adjustments that would be required if something different but close enough to the Language of Thought hypothesis is true. For instance, it was claimed in the previous chapter that there is no need for coordination with complex relata, but perhaps such relations are necessary if Connectionism is true. In that case, the theory will possibly have to posit coordination relations between the distributed connectionist equivalents of complex Language of Thought expressions, given that these have no constituent structure in a connectionist framework[58]. The relation of coordination between thoughts will then be metaphysically equivalent to the coordination relation between concepts, assuming there are concepts. These and similar concerns can evidently arise if Connectionism is true, but the justifiable hope is that the necessary

[58] These distributed representations are semantically complex in that they are systematically determined by their semantic constituents, but syntactically simple as they do not contain their determinants as constituents.

adjustments will nonetheless be possible. If so, the general outline of the Relationist solution to the type-identity problem proposed in this thesis remains largely applicable.

Concluding this section, it is worth noting that Fodor is well-known for his claim that a Language of Thought based approach to the mind is the "only game in town" (Fodor 1998: 23). The current thesis is predicated on a slightly weaker assumption, which does not consider the Language of Thought hypothesis the only option, but rather the best option given the current state of scientific knowledge. Fodor has in fact since adopted the same view:

> "I'll settle for its being the best of the current alternatives."
> (Fodor 2008: 22)

However, the claim that the Language of Thought hypothesis is the best current alternative is evidently based on the assumption that the type-identity problem can be solved, which is something Fodor actually fails to do, as the next chapters will show. As a result, the overarching aim in this thesis is not to conclusively defend the Language of Thought hypothesis against potential alternatives such as Connectionism, but rather to solve the type-identity problem that seriously compromises its viability and thus threatens its status as the most plausible theory about human cognition. Specifically, it will be argued that the type-identity problem is solvable if the Referentialist semantics endorsed by Fodor is dropped in favor of a Relationist approach to the semantic content of the Language of Thought. However, the aim in the next chapter is first to discuss the relation between the Language of Thought and a notion central to the philosophy of language and mind, namely belief.

Chapter 4

Beliefs and The Language of Thought

4.1 Introductory Remarks

This short chapter offers some clarifications on the role of Frege's Puzzle for the theory of belief and on the way the Puzzle for belief relates to the type-identity problem for the Language of Thought. On the basis of these clarifications, the thesis then finally proceeds to its core concern, which is the type-identity problem for Language of Thought expression tokens and possible solutions to it. The main goal in this chapter is to bring out some important background assumptions that are crucial for the subsequent discussion. The chapter also serves to place the type-identity problem for the Language of Thought into a broader philosophical context, where the analogous problem is discussed mostly as a Puzzle for belief.

While Frege himself did not direct much attention to his Puzzle as it affects co-referential belief constituents, Kripke contributed significantly to promoting this concern in philosophy with his seminal paper "A Puzzle about Belief" (1979). In his paper, Kripke's focuses on the way beliefs about the same object can differ in Frege-style scenarios, and Kripke discusses in great detail the difficulties this creates for classical semantic theories, including Referentialism and Fregeanism. That way, it represents a crucial philosophical starting point for the Language of Thought type-identity problem as well. Kripke's paper is very multifaceted, however, so that only a fraction of it can be considered here. At this stage, the discussion notably excludes a very important variant of the Puzzle that Kripke offers in his paper, and which Fine develops into a decisive argument for Semantic Relationism. This variant of the Puzzle is discussed later in the thesis, however.

Although the core concern of this thesis is Frege's Puzzle for the Language of Thought, it is clear that that Puzzle is closely connected with Frege's Puzzle for belief. In fact, on the Language of Thought hypothesis, beliefs are based on semantically evaluable strings in the Language of Thought. So for a Language of Thought theorist, solving the type-identity problem for the Language of Thought amounts to solving Frege's Puzzle for belief, which is a traditional philosophical problem of great interest to many philosophers of mind and language. Accordingly, potential solutions to the Kripke's Puzzle for belief are also potential solutions to the Language of Thought type-identity problem. More specifically, proponents of the Language of Thought consider beliefs to be mental attitudes towards strings in the Language of Thought that are the bearers of the content that is intuitively associated with a propositional attitude. For instance, believing that Phosphorus is a

star is to have a believing attitude towards a complex mental representation with the semantic content that Phosphorus is a star. As clarified already, this proposal applies only to occurrent beliefs. It includes beliefs that are currently entertained as well as those that explicitly stored in memory, but it excludes dispositional beliefs, which are arguably a kind of disposition rather than a kind of belief.

The chapter first highlights a crucial difference between Frege's Puzzle for belief and the same Puzzle for belief ascriptions. While the former concerns mental states, the latter is about the linguistic attribution of such mental states. After that, Frege's Puzzle for belief is introduced in more detail. Next, a popular pragmatic response the Puzzle for belief is presented, and its limitations are discussed. Subsequently, the chapter describes the linguistic options that remain to solve Frege's Puzzle for belief. The ulterior aim is to show that the same options also remain in the case of the type-identity problem for the Language of Thought, given that the type-identity problem is Frege's Puzzle for belief on a computational and symbolic conception of the mind[1]. The chapter finishes by clarifying the relation between beliefs and propositions, which is important mostly for the alternative conception of propositions rendered possible by the application of a Relationist semantics to the Language of Thought that is presented in the final chapter of the thesis.

4.2 Beliefs versus Belief Ascriptions

The by far most important distinction required to adequately understand Frege's Puzzle for belief is the difference between beliefs and belief ascriptions, as pointed out by Heck:

> "[W]e must not confuse questions about the nature of belief with questions about the semantics of belief-attribution. Questions of the former sort lie, ultimately, within the province of cognitive psychology; questions of the latter sort lie within the province of theoretical linguistics."
> (Heck 2011: 1)

Taking into account the focus on semantic theory, the crucial difference is that questions about the nature of belief ask about the semantic content of mental states, while questions about belief-attribution are concerned with the linguistic meaning of natural language sentences that contain propositional attitude predicates. This is the difference Heck emphasizes between a research project in cognitive psychology and a research project in linguistics.

Even though the difference between both projects seems prima facie obvious, Heck is right to point out that they are not always properly distinguished in the literature[2]. However, Heck also emphasizes that this can, but does not have to, mean that the two issues are confounded inadvertently. There are in fact views on which it is fully justified to run both projects together, for instance on an instrumentalist approach to beliefs. An instrumentalist about belief considers beliefs nothing more than explanatory fictions that are useful in folk psychological explanations (Fodor 2008: 5). For an instrumentalist there is thus nothing more to beliefs than belief-ascriptions, which means that the two projects collapse into the linguistic one. Heck is therefore right to stress that there

[1] The restriction "linguistic" is added here as "non-linguistic" solutions to the type-identity problem are considered later as well, such as Sainsbury and Tye's idea that the type-identity of a concept token is based on the origin of the token, that is, that two concept tokens count as type-identical if they share the same origin (2011).

[2] See especially (Heck 2011: 6, footnote 14), where Heck admits not always having properly kept them apart himself.

is only an independent issue about the content of beliefs on "broadly realist views on the mind", assuming, as is plausible, that Heck here means a realist approach to beliefs (2011: 2)[3]. However, a realist approach to beliefs does evidently not mean that one has to endorse the Language of Thought hypothesis as well[4].

Even if Heck's point was reformulated, it retains the essence of what Heck conveys. The same is true for the way Heck characterizes the different projects. Heck focuses on the scientific domain to which the projects belong, psychology and linguistics respectively. This is unfortunate insofar as it makes a fundamental ontological distinction on the basis of the way the object is scientifically studied, which is an external factor. However, there is little doubtthat Heck would agree that the objects under consideration, beliefs and natural language sentences respectively, are studied by different scientific branches only because they belong to different ontological categories. A reasonable question then is what differentiates beliefs and natural language sentences as such. In fact, it is not easy to point to a criterion that unequivocally distinguishes between them, as it heavily depends on the background views on language and thought that are held. Some might argue, for instance, that questions about belief attributions are a linguistic matter, while questions about belief are not. A non-implementational connectionist, for example, might argue that belief-attributions involve linguistic issues about syntactic structure, for instance, which is not the case for beliefs. In the quote, Heck also hints at this way of making the distinction. This is clearly not the right way to mark the divide on a Language of Thought based approach, however, as mental states such as beliefs are then also linguistic in nature. Another possibility is to argue that questions about belief are about the mind, while questions about belief-attributions are not. The basic idea is that belief-attributions are part of natural languages, which are mind-external objects[5]. However, on a much more common conception of natural languages, they are also taken to be part of the mind[6]. Hence, on the more common view, it is not possible to mark the distinction between beliefs and their attributions by virtue of the distinction between the mental and the non-mental.

For that reason, it is arguably prudent of Heck not to decisively commit to what the real difference between beliefs and their attributions is. Even so, beliefs and their attributions are clearly intuitively distinct. Obviously, the question about beliefs would arise even in a world in which no language, mental or natural, would contain propositional attitude predicates, so that belief attributions would not exist. This shows that the issue regarding the content of beliefs is independent of questions about how those beliefs are attributed by linguistic means. The people in such a world would of course lack the conceptual and/or linguistic tools required to formulate questions about belief, but that does not change the fact that it is possible to ask them about that community. Hence, to the extent that one adopts a realist approach to beliefs, it is clear that matters about the content of beliefs are independent of matters about the meaning of belief-ascriptions, which entails that both can, and in fact should, be addressed separately. In light of this, the focus here and throughout the thesis is on the nature and content of beliefs as mental states, insofar as it is issue that arises independently of the means by which such states can be attributed linguistically.

[3] In fact, a realist approach to the mind is neither sufficient nor necessary for a realist approach to belief. It is possible to maintain that there are minds but no beliefs, as perhaps some connectionists do, or to hold that there are beliefs but no minds, as perhaps some physicalists do.

[4] The latter presupposes the former, but not vice versa. Presumably, most connectionists are realist about belief, but many reject the view that mental computation uses a symbolic medium.

[5] The so-called e-language approach, where "e" stands for "external" or "externalized".

[6] The so-called i-language approach, where "i" stands for "internal" or "internalized".

4.3 Frege's Puzzle for Belief

Historically, Frege was interested in the content of linguistic expressions predominantly for the sake of foundational mathematics and logic. He noticed the difference between co-referential terms in identity statements, and it was logically and thus mathematically significant to him because of its relevance for the legitimacy of inferences (1964: 14-15)[7]. Roughly, Frege held that it is legitimate to deduce that something is both F and G on the basis of the knowledge that b is F and b is G, but not on the basis of the knowledge that b is F and c is G, even if b is c. However, Frege noted early on that propositional attitude predicates raise a similar problem (1892: 37). Just as co-referential terms cannot simply be substituted in a logically valid inference, they cannot be substituted salva veritate within the scope of a propositional attitude predicate. Moreover, this is puzzling for the same reason. As the terms to be substituted are co-referential, the respective propositional attitudes are about the very same object. Frege's well-known proposal to save the principle of substitution is to assign proper names not just a reference, but also a sense, and to maintain that within the scope of propositional attitude predicates, proper names refer to their customary senses (1892: 28). On this view, co-referential but sense-distinct terms are no longer co-referential within the scope of a propositional attitude predicate, and so no longer constitute a counterexample to the principle of substitution. The underlying justification of Frege's suggestion is the idea that the semantic contribution of proper names consists not only in the object they name, but also in a specific way they present that object. The name "Phosphorus", for instance, presents Venus as the heavenly body visible in the morning. This motivates the idea that truth-preserving substitution is not generally possible in the scope of propositional attitude predicates, as these predicates are sensitive to the way the objects are presented to the ascribee of the attitude. And it is clear that two proper names can present the same object in different ways[8].

Subsequent philosophical research has taken up Frege's statement of the Puzzle as well as his proposed solution, but the focus has been less on logic and mathematics and more on beliefs. A major impetus for this reorientation has been Kripke's influence, who presents the case of a person called Pierre who knows London under two different names without knowing that they both in fact refer to the same city (Kripke 1979)[9]. Kripke sets up his example such that Pierre believes something about London he would express by using the proper name "London" and something opposite he would express by using "Londres". Explaining that Pierre is a very rational and logically astute person, Kripke then asks the reader what Pierre really believes about London (1979: 259). That way, Kripke develops Frege's Puzzle in the context of belief. In light of the difference between beliefs and their attributions highlighted previously, Kripke's question can at least be interpreted as a question purely about the content of Pierre's mental states about London, as distinct from a question as to what beliefs can be correctly ascribed to him.

As Heck stresses, however, questions about beliefs and their ascriptions are often run together.

[7] Frege tried to ground mathematics on logic

[8] As explained, the Relationist rejects this Fregean idea for proper names considered individually and replaces it with a weaker principle on which pairs of names present their respective objects in a specific way, namely as semantically required to be the same or not.

[9] If that sounds implausible one should not that more plausible cases are easy to find. The Dutch name for the French city Lille is "Rijsel", and the French name for the German city Aachen is "Aix-La-Chapelle", and so on, for many European cities. Kripke also mentioned the example of "Holland" and "the Netherlands" (1979: 244). Other well-known examples are "Mumbai" and "Bombay" or "Myanmar" and "Burma".

Even though Kripke is not obviously guilty in this respect, he does speak very generally of "belief contexts", and he never explicitly mentions the difference between the Puzzle for belief and the Puzzle for belief ascriptions. He also moves readily from claims about what people believe to claims about what they assert and what can be ascribed to them. Regardless, Frege's Puzzle as it arises for beliefs is discussed explicitly in Kripke's paper, as well as the many contributions that react to it[10]. A major reason that the two questions have often been confounded is presumably that the problem is raised historically as the question why the substitution of co-referential names is not possible salva veritate in the scope of propositional attitude predicates (Kripke 1979: 243). The problem is that this represents a single question for which there are in fact two very distinct ways of understanding it. One can ask either what this says about beliefs, or one can ask what it says about people's practice of ascribing them. By itself, however, the question can suggest that a unique answer is appropriate, despite the fact that the two underlying questions are very different on a realist approach to belief.

And even though Kripke is perhaps not always very rigorous in separating the two questions, it is clear that for him there is real Frege Puzzle for belief. In this vein, he asks whether beliefs about Cicero are the same as the corresponding beliefs about Tully (1979: 248). And the obvious answer for him, as for many others, is that they cannot be, as one can rationally believe that Cicero is bald but that Tully is not, which entails that co-referential beliefs are distinct even if they are beliefs about the same object (1979: 248)[11]. This of course raises the question as to how such beliefs differ, which is not already answered by pointing out that they do. The possible answers to this question are the main topic of the next two chapters, where the main point of contention is whether they differ in content or not.

As the title of the paper already suggests, Kripke contends that there is a real Frege Puzzle for belief, independent of the language necessary to ascribe them:

> "The primary moral [...] is that the puzzle is a puzzle. [...] [A]ny theory of belief [...] must deal with this puzzle."
> (Kripke 1979: 267)

Whatever their background view on the nature of beliefs, most theorists agree with Kripke that people can have distinct beliefs that attribute the same property to the same object. Co-referential beliefs are considered distinct mental states. The mental state of believing that Cicero is bald is different from the mental state of believing that Tully is. Moreover, on any realist approach to beliefs, these mental states are distinct independent of how they can be linguistically attributed, as shown by the fact that they would be distinct even if no language could ascribe any mental states to anyone for lack of appropriate propositional attitude predicates. Hence, potential issues regarding belief attributions are secondary to the problem raised by Frege's Puzzle for belief. Moreover, the Puzzle is linguistic in nature only on the independent assumption that beliefs are composed of thoughts that are strings in a mental language. Even so, the fact that on the Language of Thought hypothesis the Puzzle for belief is a linguistic puzzle does not change the fact that it is

[10] The are far too many to list. Google Scholar lists 833 papers that cite Kripke's paper as of this writing.

[11] As emphasized repeatedly, locutions such as "co-referential beliefs" are shorthand for beliefs that differ only in having a distinct but co-referential proper-name equivalent, such as the belief that Tully is bald and the belief that Cicero is bald. It is not to suggest that beliefs refer like proper names do, say to a proposition. Although this view is widely held, the view here is that it is a mistake to think of the semantic relationship between a complex expression and its content along the same lines as the semantic relationship between a proper name and the object to which it refers.

entirely independent of propositional attitude ascriptions, as the linguistic nature of the puzzle is due exclusively to the assumed linguistic structure of belief.

Besides stressing that Frege's Puzzle for belief is real, Kripke also argues that Frege's sense theory offers no solution to it (1979: 247). This is prima facie surprising, as Fregeans can maintain that mental states involving co-referential beliefs are distinguishable by the fact they express different Fregean thoughts, which they do because the relevant referential belief constituents express different senses[12]. On closer inspection, the reason Kripke rejects Fregeanism is that he considers a descriptivist version of Fregeanism, on which proper names with the same associated description count as sense-identical (1979: 246). It is then not surprising that a Fregean can no longer properly distinguish co-referential beliefs if the co-referential constituents they contain have the same description associated with them. The descriptivist principle can be rejected by Fregeans, however, and so it is possible to defend Fregeanism about the content of beliefs against Kripke's arguments, which is a general point Sosa makes as well (Sosa 1996). Even so, Fine argues that Kripke implicitly raises an insurmountable difficulty for Fregeanism, which has to do with the fact that an adequate notion of "sameness of meaning" can fail to be transitive (Fine 2009: 119). It follows that even if Sosa is right that a Fregean can reject the arguments Kripke explicitly raises against Fregeanism, Kripke hints at a much deeper problem that even non-descriptivist versions of Fregeanism cannot avoid. Following Fine, it will be argued later on that in fact no version of Fregeanism can possibly avoid it, not even Sainsbury's minimal version[13].

Arguably, it is just as intuitive to assume that co-referential beliefs differ in content as it is to assume that they constitute different mental states. For Fregeans at least, the idea is very natural, given the analogy between beliefs and natural language sentences. If co-referential sentences differ in content (or meaning) because the co-referential names they contain do, and the names differ in content because of the distinct ways in which they present their object, then it is natural to assume that co-referential beliefs differ in the same way, as their proper name-like constituents can also present their objects in different ways[14]. Despite its intuitiveness, the idea that co-referential beliefs differ in content is much more controversial in the literature. Many Fregeans accept it because of the aforementioned analogy, while others such as Sosa do not, as they reject the legitimacy of drawing conclusions for the semantics of thought from the semantics of language and vice versa (Sosa 2010: 354-355). Referentialists such as Kripke and Fodor also reject the idea that co-referential beliefs differ in content. While Kripke does not really offer an alternative solution to Frege's Puzzle for belief, however, Fodor does, as is explained in the next chapter. Moreover, many proponents of a pragmatic solution to Frege's Puzzle effectively reject a difference in content between co-referential beliefs as well. The main motivation of the pragmatic solution is to argue that co-referential beliefs only appear to differ in content because of the way they are ascribed. More precisely, proponents of the pragmatic solution maintain that co-referential beliefs seem intuitively different as the respective attributions carry different implicatures. This strategy and its limitations for the Puzzle for belief are the topic of the next section. What is already evident at this point, though, is that a view on which co-referential beliefs are different mental states is not necessarily a view on which such beliefs

[12] The sense-based approach to the Puzzle for the Language of Thought is discussed in great detail in the next chapter.
[13] Sainsbury's version is therefore strategically helpful here. As it is the most minimal version, any successful argument against it undermines Fregeanism in general.
[14] Contrary to what Kripke assumes, however, this must not mean that names present their objects by virtue of a different description. A Fregean can either reject the descriptivist theory altogether, or alternatively, maintain that a difference in associated description is sufficient but not necessary for a difference in sense.

differ in content. Fodor in particular is well-known for availing himself of this fact to motivate his syntactic solution to Frege's Puzzle. Before considering these non-semantic solutions, however, first the pragmatic approach.

4.4 The Pragmatic Approach and its Limits

In light of the important distinction between beliefs and their attributions, an interesting initial question is why proponents of a pragmatic solution focus so much on the belief attributions rather than the beliefs attributed. It was mentioned that the motivation is clear on an instrumentalist approach to belief, but pragmatists do not generally endorse such an instrumentalist approach. And even Heck is right that confusion is an issue occasionally, it is not very reasonable to assume that pragmatists universally confuse questions about beliefs with questions about their attribution (Heck 2011: 6, footnote 14). The more plausible explanation is that the approach is derived from the philosophical tradition of conceptual analysis, from which it takes the idea that the determination of the nature of belief requires the analysis of the concept of belief, which means that philosophy has to examine the way the concept of belief is employed outside of philosophy. Since the concept of belief is used mostly for belief attributions in everyday life, knowledge about the nature of belief can on this approach only be attained through the semantic analysis of belief attributions.

Regardless of the ulterior philosophical motivation for the pragmatic approach, the focus in this section is more on its limitations with respect to the theory of belief than the inherent problems the theory may have. The main concern is thus not to determine whether a pragmatic approach is plausible for belief attributions, but to argue that because the Puzzle for belief arises independently of ascriptions, the pragmatic proposal is of no help in solving it. Well-known proponents of the pragmatic approach are philosophers such as Salmon (1986) and Soames (1995)[15]. This section considers a paper from Soames (1995) to present the basic idea. Although the proposals of the different pragmatists vary in detail, the basic principles of the approach at issue here are universally shared between them. Soames understands propositional attitudes as follows:

> "Propositional attitudes [...] are relations between agents and propositions."
> (Soames 1995: 515)

Soames subsequently specifies that propositions contain objects rather than their Fregean modes of presentation (1995: 517). Setting aside questions about the metaphysics of propositions, this effectively means that Soames endorses a Referentialist theory of belief content. This follows as propositions, which are the shared contents of beliefs and natural language sentences, have objects as their constituents, so that co-referential beliefs will have the same content. The reason is that co-referential proper names will have the same content by virtue of contributing the same object to a proposition (1995: 515). So according to Soames, belief attributions, which consist in specifying an agent and a proposition by means of a complex linguistic expressions, are generally unconcerned with the way an object of belief is presented to an agent. For Soames this is a desirable outcome because people often do not care about how an object of a belief is presented to an agent to which a belief is attributed (1995: 522). Even so, Soames evidently recognizes that this is not always the case:

[15] Heck (2011) provides a detailed overview.

> "However, in other contexts we may want to convey to our audience not only what proposition the agent believes, but also something about the way he believes it. In such contexts the sentence S in our belief ascription plays a dual role; its semantic function is to pick out the proposition believed, its pragmatic function is to suggest something about the way in which the agent believes the proposition."
> (Soames 1995: 523)

The key idea is that the specification of the the way in which a proposition is believed by an agent is not part of the semantic function of a belief ascription, but part of its pragmatic function. This contrasts with a Fregean approach, on which a belief attribution semantically specifies the way the object of belief is presented to an agent by virtue of the senses of the proper names used in the attribution. By attributing to an agent the belief that Phosphorus is a star, for instance, one attributes to the agent a belief about Venus as the heavenly body visible in the morning. And by attributing to an agent the belief that Hesperus is a star, one attributes to an agent a belief with a different content. It follows from the Fregean view that it is semantically incorrect to ascribe the belief that Hesperus is a star to someone who believes that Phosphorus is a star. In contrast, for the pragmatist the mode of presentation or guise under which a proposition is believed is part of what is implicated rather than semantically specified by a propositional attitude ascription. Hence, on the pragmatic approach, co-referential belief attributions will not differ in semantic content, and so they will not differ in what belief content they ascribe. Instead, they differ only in their pragmatic import. Semantically, it thus makes no difference whether a belief about Phosphorus is attributed as a belief about Phosphorus or a belief about Hesperus. Both are correct, as they ascribe beliefs with exactly the same content.

Pragmatics is generally concerned with what sentences implicate beyond their semantic content, which is to say that it seeks to specify what a speaker can communicate by using a sentence that is not strictly speaking part of its semantic content. For example, a person can respond to an invitation by answering "perhaps" in order to communicate a negative response in a polite way. Pragmatics is basically the study of the maxims that govern such implicatures. For current purposes, the important aspect is that pragmatics determines a dimension of linguistic meaning that is subsequent and supplementary to semantics. "Perhaps" still means perhaps, even if it can in certain circumstances be used to say no.

In the quote above, Soames admits that at times the way in which an object is specified seems important for the accuracy of a belief ascription, that is, that it makes a difference whether it specifies the object of belief as a heavenly body visible in the morning or in the evening. This explains why people occasionally reject as accurate a belief attribution even if it specifies the correct referential content. Taking this into account, the basic pragmatist response to Frege's Puzzle for belief is to maintain that co-referential but sense-distinct belief attributions are correct in terms of content, but misleading in that they implicate something incorrect. A concrete example will make this clear. One can imagine an Ancient Greek who believes that Phosphorus is visible in the morning. If someone attributes to this Ancient Greek the belief that Hesperus is visible in the morning, this is correct according to Soames insofar as it is true that the Ancient Greek believes of Venus that it is visible in the morning. It is misleading, however, as it suggests that the Ancient Greek would express his or her belief by asserting the Ancient Greek equivalent of "Hesperus is visible in the morning". This is not the case, however, as the Ancient Greek would

only assert the equivalent of "Phosphorus is visible in the morning"[16]. Hence, while such a belief attribution correctly renders the content of the belief of the agent according to the pragmatist, it does so in a way that implies something wrong about the way the agent would communicate the belief. The false implicature in turn explains the intuition that such a belief ascription is incorrect. The purported mistake in that case is the same mistake a father makes when he states that he has two children when in fact he has three. The statement is strictly speaking correct, because anyone who has three children also has two children, but it is incorrect in the sense that it misleadingly implies that the father has no more than two children.

The core idea shared between all pragmatic solutions is thus that believing that Hesperus is a star is to believe the same content as believing that Phosphorus is a star, and that the intuition to the contrary is entirely due to the fact that ascribing a belief that Hesperus is a star is pragmatically different from ascribing a belief that Phosphorus is. What motivates this approach to the Puzzle? To begin with, it is motivated by the fact that there is clearly something substantial shared between co-referential beliefs, as they are about the same object to which the same property is attributed. And Soames is right that ascribers of beliefs often only care about what object a belief is really about. In many circumstances, for example, people uncontroversially attribute beliefs to others by means of proper names that are unknown to the ascribees of the beliefs. Hence, Soames claims that the pragmatic proposal:

> "[...] preserves the many examples in which Russellian truth conditions for attitude ascriptions seem intuitively to be correct."
> (Soames 1995: 523)

By this Soames means that the use of a co-referential proper name is often good enough to render a belief ascription correct.

Arguably, a deeper theoretical motivation for Soames and others is the attempt to "vindicate Fregean intuitions" about co-referential terms while avoiding the "appeal to Fregean senses" (Soames 1995: 528). The pragmatic approach is supposed to enable a theorist to uphold a Referentialist semantics on which the content of proper names is only their reference (Soames 1995: 521). The Referentialist semantics captures the intuitive idea that proper names are nothing more than simple tags for objects, which makes names devoid of any content beyond their role in picking out the objects for which they stand. A basic rationale behind this view is the attempt to resist descriptivist theories of names on which names have richer semantic content, which is in turn motivated by the well-known fact that descriptivist views run into serious difficulties, for instance with regard to the fact that proper names can be shared between speakers even if they associate very different information with the bearer of the names[17]. A problematic consequence of the Referentialist view of proper names, however, is that it makes all co-referential names identical in semantic content, which leads to Frege's Puzzle. A pragmatic solution to Frege's Puzzle is therefore an attempt to defend a Referentialist semantics for proper names.

However, if a belief is only a relation between an individual and a proposition, which is the same proposition in the case of co-referential beliefs, how can it be explained that distinct but co-

[16] Alternatively, the implication is that the Ancient Greek would assent to having the belief attributed to him or her, which is not the case if the proper name "Hesperus" is used instead of "Phosphorus". Nothing here hinges on what the exact implicature is

[17] Kripke is also well-known for pointing out that it leads to difficulties in modal contexts (1972).

referential belief attributions have different implicatures? Soames answers as follows:

> "These implicatures arise from the fact that, on our view, belief is a mediated relation. An agent bears the belief relation to a proposition P iff there is some vehicle - a sentence, a mental representation, or a mental state - which has the proposition P as its content, and the agent bears a certain significant psychological relation to that vehicle - understanding and accepting the sentence, assenting to the representation, or being in the mental state."
> (Soames 1995: 525)

Beliefs are thus relations to propositions that are mediated in a certain way, which is to say that they make use of a certain vehicle, such as a natural language sentence or a mental representation. The main idea is that while the vehicle is not part of what is semantically specified by a belief attribution, it is implied by its use. For example, the attribution of a belief that Phosphorus is a star to an agent can be taken to implicate that the agent will understand and assent to the sentence "Phosphorus is a star", which is not the case for the corresponding attribution that uses the name "Hesperus" instead.

In the quote above, Soames lists several options for how propositions can be mediated. As people are supposed to be aware of these implicatures in everyday conversations, it is arguably rather implausible to assume that the attributions make implications about specific mental representations or mental states. If so, this leaves natural language sentences as the by far most plausible option in everyday scenarios. More important for current purposes, however, is the question whether a pragmatist assumes that the underlying beliefs are the same or not. If the pragmatist assumes there is a difference in underlying mental representation, then co-referential beliefs will be distinct vehicles with the same semantic content. The pragmatist will then have the same view on beliefs as Fodor, who also claims that co-referential beliefs differ syntactically but not semantically, assuming the linguistic nature of belief is taken for granted. As this view is discussed in detail in the next chapter, it can be set aside for now. Alternatively, if less intuitive, a pragmatist can maintain that the beliefs do not differ at all, as the difference will lie exclusively in the way in which an agent would express the belief.

Either way, it is clear that for Soames co-referential beliefs will have the same content. Hence, if one assumes that beliefs have linguistic structure, co-referential beliefs will differ at most syntactically. The reason is that the pragmatic difference in the attribution has no possible correlate in the beliefs, as beliefs by themselves do not carry implicatures. Whether this is ultimately plausible or not as a theory of the meaning of propositional attitude attributions, the main concern for current purposes is that a pragmatic difference is only available to distinguish the ascriptions and not the beliefs themselves. Hence, by itself the view in fact provides no answer to the question whether such beliefs differ, and if so, how. This is a problem, however, for instance with respect to the role of beliefs in psychological laws. It was shown in a previous chapter that the assumption that co-referential beliefs are the same results in the spurious falsifications of prima facie true psychological laws. Purported generalizations concerning beliefs about Superman will fail to hold because of contrary beliefs about Kent. Since the pragmatics of belief attributions is irrelevant for that issue, the proposal offers no solution to it. The account can evidently be supplemented with a suitable theory for belief, for instance Fodor's theory that co-referential beliefs differ only syntactically, which should in fact be particularly appealing to pragmatists as it shares the aim to accommodate Fregean intuitions

without adopting a Fregean semantics. But in that case, pragmatists at least seem to make the mistake of thinking that by solving a variant of Frege's Puzzle for belief attributions, they have solved the only Frege Puzzle for belief there is. Although this is not stated explicitly, it is implied by the claim that a pragmatic approach to belief attributions makes a Fregean semantics redundant, regardless of the theory of belief. This cannot be true unless one rejects a realist approach to beliefs, however. Kripke shows that Frege's Puzzle is a real problem for a realist theory of belief, which is confirmed by the role of beliefs in linguistic communication and psychological laws, and to this problem the pragmatic approach offers no independent solution.

A purely pragmatist solution to Frege's Puzzle for belief is thus not possible. It is important that the unavailability of a pragmatic solution does not depend on a commitment to the Language of Thought hypothesis. It holds true for beliefs whatever the view on their nature ultimately is. If anything, the Language of Thought hypothesis makes a pragmatic solution more reasonable, as it takes beliefs to be sentential entities, which are at least the kind of entity that can have a pragmatics. Yet despite its linguistic nature, the Language of Thought has no pragmatic dimension. The reason a pragmatic solution is not available even on a view on which beliefs are language-like entities is evidently that the Language of Thought is a mental language which therefore has no pragmatic dimension. Since beliefs are generally accepted to be mental entities, however, a pragmatic solution is unavailable for the Puzzle for beliefs, independent of the view on the nature of belief adopted.

In conclusion, a purely pragmatic solution can only be upheld on an instrumentalist approach to belief. This view can either be committed to the non-existence of beliefs or it can reject any commitment to their existence. In either case, the proposal will not contribute towards a workable theory of mind that can be used to explain how psychological laws can be true or how linguistic communication works. It can therefore be set aside for current purposes. Most pragmatists are manifestly not pure pragmatists in this sense. Soames, for instance, opts for a strategy akin to Fodor's by arguing that co-referential beliefs constitute different mental states with identical content (1995: 533). He attributes a similar proposal to other pragmatists as well (1995: 526). Even so, the pragmatic option as such can be ignored for the Puzzle for belief. In terms of belief, its proponents will fall into a category that will be discussed in the next chapter, which is most likely Fodor's category, given that he shares their professed aim of avoiding a Fregean sense theory for the content of belief[18].

4.5 Two Remaining Options: Syntax and Semantics

It was mentioned that the widely shared view that co-referential beliefs are different mental states does not entail that they differ in content. Since there is no viable pragmatic alternative for belief, this leaves two ways of distinguishing co-referential beliefs. They can be distinguished either by their content or by their syntactic form. These are the only two remaining options on the following three assumptions. First, the assumption that beliefs really exists and secondly, that they have linguistic structure. Thirdly, one has to agree to the widely accepted threefold division of linguistic structure into syntax, semantics, and pragmatics. As a result, Fregeans, for instance,

[18] This is not necessary as a pragmatist about belief ascriptions can be a Fregean about the content of beliefs. But it remains likely as most pragmatists are pragmatists about ascriptions precisely because they are Referentialist about semantic content.

will distinguish co-referential beliefs by their content, as does the Semantic Relationist. Fodor, in contrast, notoriously argues that co-referential beliefs are different syntactic vehicles that share the same semantic content. In his terminology, co-referential beliefs involve different thoughts that express the same proposition. As seen, many pragmatists seem to favor this view as well, or something that is close enough to it for current purposes. As a result, the field is divided into two major camps. On the one hand there are the theorists who think that Frege's Puzzle for belief primarily says something about mental representations, and on the other hand there are theorists who think it primarily says something about their content.

This is not to suggest that it is always easy to determine how to classify a given proposal. Pragmatists, for instance, are not always very clear about how they think the underlying beliefs differ. The same is true for Heck's formal solution presented earlier. Arguably, Heck's view is best considered a variant of the syntactic solution. Heck clearly endorses the first two assumptions mentioned above. He endorses a realist approach to beliefs (2011: 2). He also thinks the Language of Thought hypothesis is most likely true, which means that he accepts that beliefs are probably linguistically structured (2011: 22). It is also reasonable to assume that Heck does not reject the generally accepted threefold division of linguistic analysis, if otherwise he would make this rejection explicit. Hence, it is fair to conclude that his formal relations are supposed to belong to the syntax of a language. Heck himself reinforces this view when he speaks of the formal relations within a language "being a consequence of its intrinsic syntactic properties" (2011: 27). This is of strategic importance because in the next chapter, the thesis focuses almost exclusively on Fodor's syntactic solution to the Puzzle. Since Heck's approach is fundamentally of the same variety, however, the general arguments raised against Fodor will apply mutatis mutandis to Heck as well[19]. There are of course important differences between Heck and Fodor. For instance, Heck claims that his view is Relationist in much the same way that Semantic Relationism is (2011: 27). However, as the main argument against Fodor is that appealing to syntax alone is not sufficient to solve Frege's Puzzle for belief, this will apply to Heck's proposal as well, irrespective of its Relationist nature. Importantly, the same also holds true for the implicit non-semantic proposals endorsed by most pragmatists.

As seen, co-referential beliefs can be distinguished syntactically or semantically. A crucial point to make in this regard is that the choice is not between a purely syntactic difference on the one hand and a purely semantic difference on the other. Rather, the choice is between the existence of only a syntactic difference, without a corresponding difference in content, and the existence of both a syntactic and a semantic difference. Hence, the proponents of the syntactic approach maintain that co-referential expressions are different expressions with the same content, while the advocates of the semantic approach hold that they are different expressions with different content. So the syntactic approach sees co-referential beliefs as syntactically distinct vehicles that share a content, while the semantic approach sees them as syntactically distinct vehicles with different content. This fact is important because Fodor argues against Fregeanism for the Language of Thought on the basis that modes of presentations must be in the head, which senses are not (Fodor 1998: 17-22). That way, he claims that Fregeanism is unsatisfactory because whatever distinguishes co-referential mental representations must be in the head, which syntactic properties are, but abstract senses are not. However, a Fregean about the Language of Thought will evidently argue that there is both

[19] The same is also true for Schneider (2009b).

a syntactic and a semantic difference between co-referential belief constituents. The Fregean can thus accept Fodor's point that co-referential beliefs have to be distinguished syntactically, while holding on to the idea that a difference in mode of presentation is a difference in the content of co-referential expressions, which exists in addition to the syntactic difference, that is, in addition to the fact that co-referential belief constituents represent distinct vehicles of content.

Another important point is that a proponent of the semantic approach has additional theoretical work to do. First of all, it has to be determined what the presumed difference in content consists in. A classical Fregean, for instance, will hold that the difference in content consists in a difference in sense, which in turn represents a difference in how a reference is semantically presented to a thinker. Importantly, the requirement that the semantic difference has to be theoretically spelled out holds true even if it is claimed that the semantic difference is entirely due to a syntactic one. A Fregean, for example, could maintain that differences in mode of presentation are in fact entirely due to differences in representational vehicle, thus co-opting Fodor's view. A difference in representational vehicle would then entail a difference in sense, which means that a syntactic difference would constitute a semantic one. Even so, once a semantic difference is posited, it has to be specified what the semantic difference consists in. Hence, a proponent of a syntax-based variant of Fregeanism still has to develop a theory of senses, thereby addressing issues such as how senses behave semantically and what their ontological nature is. A view which explains semantic properties on the basis of syntactic properties assumes the additional obligation to explain how the semantic properties relate to the syntactic ones. A proponent of a syntax-based sense theory could meet this obligation by maintaining that representational vehicles are semantically relevant via being the modes of presentations that senses capture. On this proposal, differences in representational vehicle will show up as semantic differences in sense by virtue of the fact that vehicles of content constitute the modes of presentation that senses semantically capture.

The Semantic Relationist about the Language of Thought faces the same explanatory obligation. Unlike the Fregean, the Relationist will characterize the required difference in content between co-referential expressions as a difference in coordination, which is a semantic difference in the way expressions present their reference pairwise rather than individually. That way, Semantic Relationism represents a semantic theory that explicitly determines the semantic difference between co-referential expressions, in much the same way a Fregean sense theory does. As regards the second requirement about the relation between semantic and syntactic properties, this thesis proposes that intrasubjectively, that is, within individual minds, sameness of vehicle is both necessary and sufficient for coordination[20]. Intrasubjectively, sameness of syntactic vehicle will thus show up as coordination in the semantics of the Language of Thought, while a difference in vehicle will show up as lack of coordination in the semantics. To make this clear, one can consider the difference between an informative and an uninformative identity thought, such as the thought that Phosphorus is Hesperus and the thought that Hesperus is Hesperus. These identity thoughts will differ in content for the Semantic Relationist because of a difference in coordination. While the referring expressions in the uninformative identity statement are coordinated, they are uncoordinated in the informative statement. Since coordination (or lack thereof) between its constituents is part of the semantic content of complex expressions, the thoughts will differ in semantic content. Within individual minds, this difference in coordination is in turn taken to hold in virtue of a difference

[20] This is not generally the case, as it is not the case intersubjectively, about which more later.

in representational vehicle. In the uninformative thought, both Language of Thought expressions are of the same syntactic type, while in the informative case, they are not. That way, a syntactic difference in vehicle explains a semantic difference in coordination. In response to the requirement mentioned above about the relation between the syntax and the semantics, the proposal thus adopts the principle that intrasubjective coordination holds in virtue of syntactic identity as a matter of both necessity and sufficiency. In other words, intrasubjectively coordinated expressions have to be syntactically type-identical, and type-identical expressions have to be coordinated.

4.6 Propositional Attitudes as Relations to Propositions

This final section offers some elucidating remarks on propositions, or rather on the attitudes towards propositions, which serves to put the type-identity problem for the Language of Thought into a broader philosophical context. Although it is widely accepted in contemporary philosophy that propositional attitudes such as beliefs are cognitive relations to propositions, this does not by itself say much about how that cognitive relation is understood or what the nature of propositions is taken to be. So before proceeding with a detailed discussion of the type-identity problem for the Language of Thought, the aim here is to briefly clarify the view on propositional attitudes adopted in this thesis. The focus here is mostly on the relation between individuals and propositions rather than the propositions themselves, as they will be discussed in greater detail in an independent chapter. This section first indicates what the classical view on propositional attitudes in the literature is, and then offers an alternative developed by Fodor and Field, among others, a version of which is adopted in this thesis as well.

As mentioned, there is general agreement that propositional attitudes are fundamentally relations between individuals and propositions. On the most prevalent conception of propositions, these propositions are mind-external objects that are also the contents of natural language sentences (King 2008). Hence, to believe that Phosphorus is a star is to stand in the cognitive relation of believing to an object that is the content of the sentence "Phosphorus is a star":

> "A propositional attitude, then, is the mental state of having some attitude, stance, take, or opinion about a proposition."
> (Schwitzgebel 2011)

The classical view on propositional attitudes then is that

> "propositional attitudes are binary relations between individuals and propositions."
> (Richard 1997: 197)

To begin with, this conception is supposed to exclude some unconventional views on propositional attitudes such as Russell's view that they are what he calls "multiple" relations to the individual objects in a proposition (Moltmann 2003: 95)[21]. On Russell's view, the belief that Phosphorus is a star is (at least) a tertiary relation between an individual, Phosphorus and the property of being a star. In contrast, the classical view recognizes only the entire proposition as an actual relatum of the propositional attitude relation, and not the objects within that proposition. Hence, the view is committed to propositions being complex entities of some sort, but it otherwise leaves open the

[21] Moltmann (2003, 2009) defends this conception of propositional attitudes.

precise nature and constitution of propositions. The view can thus accommodate different opinions on whether propositions are structured objects or not, or whether they contain everyday objects, as Russell thought, or something that stands in for these objects, such as Fregean senses[22]. The classical view on propositional attitudes is compatible with many different views on propositions.

More importantly, the classical view considers a propositional attitude to be a binary relation between an individual and a proposition, that is, between an individual and a mind-external object that is the content of one or more sentential linguistic expressions. While this says nothing about the nature of the cognitive relation between individuals and propositions, it is committed to the fact that is has only two relata, individuals and propositions. In contrast, many theorist think that the cognitive relations between individuals and propositions depend essentially on the representational capacities of the mind. They therefore endorse a representational view on propositional attitudes on which these essentially "involv[e] entities [...] contained in the mind" (Schwitzgebel 2011). Accordingly, the representational view posits three relata as essential for propositional attitudes, namely an individual, a proposition, and something representational in the mind of the individual.

In light of the representational approach, about which more in a moment, the proponents of the classical binary view have two ways to respond. They can either reject the representational approach as incorrect, or maintain that is inessential with regard to the nature of propositional attitudes. The first option can be adopted by someone who wants to reject a representational theory of mind but wants to maintain a realist conception of propositional attitudes. Some dispositionalists about belief arguably fall into this category. The second option is to:

> "trea[t] the internal structure of the mind as of only incidental relevance to the question of whether a being is properly described as believing."
> (Schwitzgebel 2011)

An advocate of this option can accept that a representational approach is perhaps correct in the case of human minds, but reject the idea that representation is essential to the nature of propositional attitudes. In other words, this view holds that propositional attitudes are essentially binary relations between individuals and propositions, even if this relation is mediated by mental representation in the case of humans. Arguably, Soames defends such a view (Soames 1995).

The alternative representational view, on which mental representations are essential to propositional attitudes, is famously held by Fodor, who argues that propositional attitudes are relations between individuals and Language of Thought sentences tokened in their mind (1998: 8). The same approach is nicely expounded by Field (1978). Field takes propositional attitudes to be primarily relations between individuals and their mind-internal mental representations, which representations in turn express the content that is intuitively associated with a propositional attitude. On this view, a belief is an attitude towards a content only via being an attitude towards a bearer of that content. Beliefs are therefore "composite" relations composed of an attitudinal relation towards a vehicle, and a semantic relation between that vehicle and its content:

> "The account involves the assumption that the belief relation is a composite of two other relations: first, a relation between a person and a sentence that the person understands; second, a relation between the sentence and a set of possible worlds."
> (Field 1978: 12)

[22] These questions are a matter of lively debate, see King (2008) and McGrath (2008) for an overview.

Field appeals to natural language sentences rather than Language of Thought sentences at this stage, but later argues that these sentences must be sententially structured mental representations given that it is possible to have beliefs without understanding a language (1978: 18). Hence, the resulting view is that a belief consists essentially of two relations, namely an attitudinal relation between and individual and a Language of Thought sentence, and a semantic relation between that sentence and the proposition it expresses as its content. In Fodor's words:

> "[The Language of Thought hypothesis] says that propositional attitudes are relations between minds and mental representations that express the contents of the attitudes." (Fodor 2008: 69)

On the proposed view, propositional attitudes are essentially vehicle-mediated relations to contents. Hence, propositional attitudes involve mental representations as a matter of necessity, which entails that propositional attitudes are essentially tertiary relations. There can be no propositional attitudes without mental representations, which is at least metaphysically possible on the classical view.

As this thesis defends the Language of Thought hypothesis, it largely adopts this representational conception of propositional attitudes as well. A major difference, however, is that on the current view, classical propositions as structured content entities do not exist, which is why propositions are considered vehicles of semantic content instead. Put differently, sententially structured mental representations do not express but are propositions. Propositional attitudes remain attitudinal relations to propositions on this view, but these propositions are not the semantic content of the attitudes. They are instead the vehicles of that content, and their content is in turn a complex semantic property of the proposition. This does not change the fact that propositional attitudes are essentially tertiary relations that involve individuals, complex mental representations and their semantic content. Also, the relation is still composed of two more basic relations, namely an attitudinal relation between an individual and a proposition, and a semantic relation between a proposition and its content[23]. The proposal is thus that propositions are in fact what Fodor calls thoughts, while the objects Fodor calls propositions do not exist, as the complex content of sentential mental representations is not conceived of as a complex object. Hence, classical propositions are rejected as the result of the illegitimate objectification of the semantic properties of Language of Thought sentences. It is clear that more needs to be said about this conception of propositions, which the thesis does in the final chapter. For now, this alternative proposal is mentioned purely for the sake of clarity and completeness.

The reason the binary view can be called the classical view is mostly that it is non-committal regarding questions about the mind, in line with the historical roots of the view in philosophers such as Frege and Russell, who discussed semantics exclusively in terms of an immediate relation between natural language sentences and propositions (or Fregean thoughts). Despite this venerable origin, the classical view is apparently no longer the standard view in philosophy:

> "it is probably fair to say that the majority of contemporary philosophers of mind accept the [...] representational approach to belief, according to which central cases of belief involve someone's having in her head or mind a representation with the same

[23] The latter relation is not a relation between two objects, however, but an instantiation relation between an object and a property. As per compositionality, propositions instantiate complex semantic properties by virtue of their syntactic structure and the semantic properties of their basic constituents.

propositional content as the belief."
(Schwitzgebel 2011)

Heck also claims that the binary proposal "is not a view that is widely held" (2011: 3). If so, Richard's definition mentioned above is no longer representative in contemporary philosophy. Schwitzgebel's comment, however, does not settle the question whether most philosophers in fact agree that mental representations are essential to propositional attitudes. Moreover, it does not mean either that most philosophers accept that the mental vehicles involved in propositional attitudes are sentences in a Language of Thought. It is therefore possible that many philosophers reject a commitment to linguistically structured vehicles of representation as essential to propositional attitudes, either because they endorse a view on which mental representations have a map-like structure, say, or because they think that conceptual analysis shows that mental representations are not essential to propositional attitudes. As a result, the proposal adopted here on the basis of Field and Fodor differs from others at the very least in that it is unequivocal about the nature of the relation that holds between mental representations and the contents of propositional attitudes. Specifically, it holds that the relation is semantic, which means that the content of a complex mental representation is linguistically and compositionally determined by its syntactic structure and the semantic content of its basic constituents. In contrast, a map-like mental representation will not semantically express a proposition in this way. It may make some propositions true and others false, but it does not semantically express the propositions it makes true.

On the proposed view, a propositional attitude is essentially a tertiary relation, and it essentially involves a semantic relation between a syntactic object and the content intuitively associated with an attitude as its object. Hence, fearing, say, that Phosphorus is falling to the earth essentially involves a mental representation with the content that Phosphorus is falling to the earth. Propositional attitudes are thus essentially but indirectly relations between individuals and a semantic content. The relation between individuals and a semantic content is constitutively based on two other relations. On the one hand, it is based on a relation between and individual and a syntactically structured mental representation, which obtains in case an individual instantiates a token of that representation (as well as something additional to account for the attitude, be it fearing, hoping, believing etc.). On the other hand, it is based on a semantic relation between that representation and its content, which obtains if a representation has a given semantic content. The basic constituents will have their content as a matter of empirical fact, while complex expressions will have their complex semantic content in virtue of their syntactic structure and the semantic content of their basic constituents. For Fodor, the latter semantic relationship holds between two objects, namely a thought and a proposition. On the alternative view proposed here, on which propositions are content bearers rather than contents, the semantic relationship holds between an object and a property instead, namely between a proposition and a semantic content that is a complex property of that proposition. An obvious consequence of this view is that there can be no propositions without mental representations, simply because propositions are mental representations[24].

[24] Not all mental representations are propositions, of course. Concepts, for instance, are not. Propositions are sententially structured mental representations. Although this means that there can be no propositions without mental representations, that is not to say that there can be no propositions without mental representation tokens, for instance in case there are no humans or other beings with sufficiently complex cognitive capacities. If propositions are mental representations, the type/token distinction applies to them, and so the question whether proposition types can and do exist without tokens is an independent issue.

Incidentally, it is interesting to note that Heck's Relationist proposal diverges from Fine's precisely with regard to whether mental representations are essential to propositions:

> "As I see it, the issue between me and Fine is whether the notion of a content, or proposition, is intelligible absent some notion of a representation: something that also has non-semantic properties, such as a sentence or a mental state. If it is, then the fundamental notion of validity should presumably be characterized directly in terms of propositions, and the approach taken here will seem to appeal to something inessential, namely, representations. My view is as it is because I do regard representations as essential to representation."
> (Heck 2011: 43)

Heck makes this point to defend his view that his formal relations have content bearers rather than contents as relata, unlike Fine's coordination relations. The current proposals agrees with Heck in this regard. Specifically, Heck is correct in pointing out that if representation is not essential to propositions, then coordination must hold between contents rather than their bearers. So if Fine does not consider bearers of content essential to content, he has no choice but to posit contents as the relata of the coordination relation. This understanding of Semantic Relationism was rejected, however, in favor of a view that coordination holds between mental representations. The current proposal thus accepts Heck's tenet that propositions essentially involve mental representations[25]. However, it was also explained that the current view differs from Heck in that he assumes that his formal relations are not part of the semantics of a language, while the view adopted here agrees with Fine that coordination is a semantic relation. In sum, the proposed view differs from both Heck and Fine in the following way. While Fine posits coordination as a semantic relation with semantic relata, and Heck posits and analogous syntactic relation with syntactic relata, the current proposal holds that coordination is a semantic relation with syntactic objects as relata.

The conclusion of this chapter is as follows. First of all, the type-identity problem for the Language of Thought is identical the Puzzle for belief on a Language of Thought based approach to the mind. The Puzzle is thus linguistic in the sense that it is a Puzzle for a language, but it is non-linguistic in the sense that it does not depend on the way mental states are linguistically ascribed. As a result, a purely pragmatic solution to the Puzzle for belief is not available. On the assumption that beliefs are real and constitute distinct mental states even if they are co-referential, this leaves two main points of contention for subsequent discussion. The first and foremost question is whether co-referential beliefs differ in content. The second and subsequent question is how they differ in semantic content, assuming it can be shown that they do.

[25] Even more so than Heck, actually, as on the current view propositions are mental representations, so there cannot be a possible world in which there are propositions but no mental representations. Presumably, Heck thinks this too, as he claims there is an essential connection between propositions and mental representations, but it is not obvious that it is actually true on his view, as it is not evident why on his view on which propositions are Russellian there could not be a world in which there are propositions but no mental representations.

Chapter 5

Frege's Puzzle and the Content of the Language of Thought

5.1 Introductory Remarks

The previous discussion showed how Frege's Puzzle affects the Language of Thought hypothesis as a problem regarding the proper type-identification of Language of Thought symbol tokens. As explained, the type-identity problem consists in providing an appropriate answer to the question when and why two mental representation tokens count as type-identical. By Fodor's own admission, a missing answer threatens the overall viability of the hypothesis, and so functions as a possible argument in favor of the alternative connectionist conception of the mind.

The principal purpose of this and the following chapter is to combine a Language of Thought based approach to the mind with a Relationist approach to semantics. On the one hand, the application of Semantic Relationism to the Language of Thought allows for certain modifications of Fine's original proposal, which makes it more accessible and plausible overall. On the other hand, and more importantly, it enables to restore the viability of the Language of Thought hypothesis in light of the type-identity problem. In this chapter, the focus is on the major semantic alternatives to Semantic Relationism, most notably Referentialism, Fregeanism and Conceptual or Inferential Role Semantics. The aim is to highlight the fundamental difficulties that arise in their use as theories of content for the Language of Thought.

Incidentally, the relevance of Frege's Puzzle for the Language of Thought also shows that despite its philosophical origin, the Puzzle constitutes a substantial scientific problem that affects research beyond philosophy[1]. In terms of the broader scientific relevance of the Puzzle, two areas of research are especially worth mentioning. As pointed out, the Puzzle is first of all significant for psychology and cognitive science to the extent that research in those areas is based on a computational theory of mind, according to which the mind is a system that processes information on the basis of physically encoded symbols with syntactic properties. Secondly, it affects linguistics on a widely adopted generative understanding of grammar, on which linguistic competence is exercised through the translation of natural language sentences into thoughts that provide the deep structure of natural

[1] It also shows that even if the problem is initially a problem within the philosophy of language, it extends to other philosophical areas as well, most notably the philosophy of mind.

language sentences that are fundamental to their correct interpretation. In line with this, it was shown that a solution to the type-identity problem for the Language of Thought is required to make sense of true psychological laws and successful linguistic communication, which consists in the transmission of thoughts between speakers by means of a shared natural language.

5.2 Referentialism and the Language of Thought

5.2.1 Fodor's Referentialist Semantics for the Language of Thought

As is well-known, Fodor endorses of a Referentialist semantics that recognizes as content only reference, which consists in a relation between linguistic expressions and extra-linguistic objects:

> "[C]ontent is constituted, exhaustively, by symbol-world relations."
> (Fodor 1998: 14)

In his latest contribution on the topic, Fodor states that after due consideration:

> "[A] conclusion [...] now strikes me as inevitable: that pure Referentialism is the kind of semantics that [the Representational Theory of Mind] requires; that is, one that says that reference is the only primitive mind-world semantic property."
> (Fodor 2008: 16)

Fodor claims that only Referentialism constitutes an appropriate semantic theory for the Language of Thought. What is the motivation for this claim? As mentioned occasionally, there is clearly an intuitive basis for Referentialism, especially for proper names, as there is a certain pre-theoretical plausibility to the idea that proper names function linguistically as simple tags for objects. A great many philosophers besides Fodor have endorsed a Referentialist semantics for this reason, amongst others Kripke (1972, 1979), Kaplan (1977), Salmon (1986, 1989b), Soames (1995). Unlike these philosophers, however, Fodor argues for a Referentialist semantics specifically in the context of the Language of Thought. According to Fodor, Referentialism represents the only semantic theory adequate as a theory of content for the Language of Thought.

Fodor adduces both positive and negative arguments for Referentialism for the Language of Thought. Positively, one of his professed aims is to defend a naturalistic semantics, which assumes that semantic properties and relations are universally reducible to non-semantic properties and relations (Fodor 2008: 18, footnote 34):

> "[T]he basic idea is that 'dog' means dog because of some (non-semantic) relation that holds between the symbol and the animal."
> (Fodor and Lepore 1993: 17)

More specifically, Fodor aims to reduce the relation of reference between linguistic entities and extra-linguistic objects to a causal relation between the latter and tokens of the former, thus yielding a version of what is called a causal theory of mental content (Adams and Aizawa 2010). On Fodor's view, the reference between mental representations and objects is based on the causal relation of the objects reliably causing mental representation tokens, with the caveat that such a content-determining causal relation cannot "asymmetrically depend" on the same causal relation between another type of object and that very same mental representation (Fodor 1999: 522).

Roughly, the idea is that the concept COW does not mean the same as the concept HORSE, even if horses occasionally cause tokens of the concept COW, because horses only cause tokens of the concept COW because cows did so previously (but not vice versa, hence the asymmetry). Anyway, the specifics of the proposal are not crucial for current purposes. What is important is rather that Fodor maintains, first, that any posited semantic property or relation must be reducible to a non-semantic property or relation, and secondly, that only reference is so reducible. In this vein, Fodor suggests that a major problem for Fregeanism is that the assumed semantic relation between a linguistic entity and its sense is not naturalistically reducible in the way reference is:

> "Frege clearly thought that a naturalistic theory of senses is out of the question; [...] and so do I. However, [he] didn't mind a naturalistic theory of senses being out of the question because [he wasnt't a] naturalist. I am, so I do."
> (Fodor 2008: 52, footnote 3)

The underlying reason that motivates this view is that the relation between a token linguistic expression and its sense can never be reduced to a causal relation, because Fregean senses are essentially abstract objects outside of the causal realm. Unfortunately, a detailed discussion of the merits of naturalizing semantics and the success of the various attempts offered so far, including Fodor's own, is beyond the scope of the thesis[2]. The issue of naturalism and semantic theory is therefore largely set aside here. Even so, it is useful to briefly mention that the current proposal is predicated on a certain degree of skepticism regarding Fodor's naturalistic project. To begin with, it is hard to see how any causal theory could explain the reference between mental representations and abstract objects, such as numbers, sets or types. This and similar worries represent good reasons to remain skeptical about the ultimate prospects of a universal reduction of semantic properties and relations. The failure to reduce reference to a non-semantic causal relation in turn reduces the pressure to attempt the reduction of other semantic properties and relations. In other words, if a reductive account is not feasible even for Fodor's paradigmatic case of reference, then it is not a real concern if a semantic theory posits additional semantic relations that are irreducible, such as the relation of expressing a sense or of being semantically coordinated. The skepticism about the reduction of semantic notions does mean that the current thesis abandons naturalism, however. Instead, it is sensible to assume that while semantic properties are not reducible to natural properties, they are in fact part of the natural properties. In other words, the view is that the realm of the natural includes semantic properties and relations as a matter of empirical fact, for the simple reason that nature has evolved beings with advanced cognitive faculties such as humans. An account on which semantic properties are fundamental and irreducible is thus not ipso facto a non-naturalistic account. Contrary to what Fodor suggests, it is in fact possible to share his enthusiasm for naturalism while remaining skeptical about his reductionism.

At least as important as Fodor's positive motivation for a Referentialist semantics is his negative motivation for rejecting alternative semantic theories. For instance, Fodor thinks the Fregean claim that a theory of senses can explain what differentiates co-referential concepts is false (Fodor 2008: 16-22). Accordingly, he thinks that the Fregean alternative to Referentialism fails. He similarly holds that the compositionality of content, which is non-negotiable, undermines other semantic alternatives, particularly Inferential and Conceptual Role Semantics (Fodor 2008: 18, 20). The failure of such richer semantic theories strengthens Fodor's belief that Referentialism is

[2] For a good overview, see Adams (2010).

the only viable semantic option. Although the current thesis agrees with Fodor's assessment of the alternative semantic theories he considers, if not necessarily for the same reasons, the major problem with his reasoning is that it misses a key alternative, namely Semantic Relationism. A major aim in the next chapter is therefore to show that Semantic Relationism can solve Frege's Puzzle for the Language of Thought while avoiding the problems that undermine the alternative approaches. Another major objective in this chapter is to show that Referentialism for the Language of Thought is itself highly problematic because of Frege's Puzzle. In combination, this makes for a strong case in favor of a Relationist approach to the theory of content of the Language of Thought.

5.2.2 A Problem for Referentialism: Frege Cases

Unsurprisingly, a major stumbling block for a Referentialist semantics for the Language of Thought is Frege's Puzzle. As mentioned, the Puzzle arises as the type-identity problem for Language of Thought expression tokens (Aydede 1998). The basic issue Aydede raises is for the Language of Thought theorist to determine when and why two expression tokens count as type-identical. As explained, this is required for the idea that thoughts can be shared, which they are if distinct minds each instantiate a type-identical thought token, which are effectively distinct physical realizations of the same type of thought. The idea that thoughts are shareable is in turn important to account for the law-like psychological explanation of behavior on the basis of shared beliefs, as well as for linguistic communication that consists in the transmission of thoughts by linguistic means. A similar point holds in the case of reasoning as well. Modus ponens reasoning, for instance, requires the repeated input of the same type of thought, which means that the same thought has to be tokened at different points in time. All these views thus presuppose that different subjects can have the same thoughts, and that subjects can have the very same thought at different moments in time. An adequate criterion to determine the type-identity Language of Thought expression tokens is therefore crucial for any view that is based on the Language of Thought Hypothesis.

The pivotal question then is whether Referentialism provides a notion of content adequate to properly type-identify proper name-like Language of Thought expression tokens[3]. In many cases, the obvious answer is yes. For instance, tokens of thoughts about the moon can be distinguished from tokens of identical thoughts about the sun, such as the thought of being a heavenly body, by virtue of the fact that the former are about the moon and the latter about the sun. This evidently works across thinkers as well as times. Thought tokens about the moon share the semantic property of being about the moon whether they are instantiated by the same thinker at different points in time or by different thinkers. Accordingly, thoughts about the moon can be type-identified by their reference, and they can also be easily distinguished from identical token thoughts about the sun, which do not share the semantic property of being about the moon[4].

The obvious problem is that Frege's Puzzle calls into question the exclusive appeal to referential

[3] The equivalents of proper names in the Language of Thought are mental representations often referred to as singular concepts.

[4] Syntactic structure is of course relevant as well, so that the thought that the moon is bigger than sun can be distinguished from thought that sun is bigger than moon, even though both are about the same objects. The relevant difference in syntactic structure is clearly that the first makes reference to the moon in the subject position, while the other does so in the object position. It was already explained that such differences can be explained compositionally by the differences in content between non-basic syntactic constituents, in this case "being bigger than the sun" and "being bigger than the moon" respectively, which can in turn be compositionally explained by the difference in content between "sun" and "moon".

content, which raises the following question:

> "what makes co-[referential] concepts type-distinct?"
> (Aydede 1998: 290)[5]

It is evident that referential content is of no use as a criterion to type-distinguish co-referential concepts and the thoughts that contain them. That such thoughts and concepts can nonetheless be type-distinct for Fodor is evidenced by his:

> "account of belief individuation that permits beliefs that are identical in content to be distinct beliefs; in particular, one that permits beliefs with the same content to differ in their causal powers."
> (Fodor 2008: 68)

As a reminder, thoughts for Fodor are the content-carrying components of belief, and so beliefs differ in content if the thoughts they contain differ in content and beliefs are distinct mental states if they contain distinct thoughts. Fodor's point then is that thoughts can be distinct even if they share a content, which entails that concepts can be distinct even if their share a content as well. It follows that token concepts can be type-distinct even if they are co-referential, and the same is true for the thoughts and beliefs that contain them[6]. In the quote, Fodor states an obvious reason for his assumption that co-referential should be considered distinct mental states, namely the fact that they can have different causal powers. An example mentioned by Aydede is a belief based on the thought that Superman is close, which has a different causal impact on the behavior of a person in danger than the corresponding belief based on the thought that Clark Kent is close, even if both thoughts are about the same object (Aydede 1998: 293). As on Fodor's view causal explanations invoke belief types to state law-like regularities about their tokens, it is clear that co-referential thought tokens, and so concept tokens as well, have to count as type-distinct.

Although Fodor takes issue with some formulations or variants of Frege's Puzzle for the Language of Thought, he ultimately accepts the challenge it presents to the Referentialist. In line with this, he argues that some variants discussed in the literature can easily be solved on a Referentialist semantics. Complex denoting concepts, for instance, can be distinguished by their constituent structure (Fodor 2008: 60). That way, Fodor explains, THE MORNING STAR can be distinguished from THE EVENING STAR. They have different constituents, which are in turn are distinguishable by their reference, that is, by the fact that the reference of MORNING is different from the reference of EVENING. Hence, reference is enough to "solve" this variant of Frege's Puzzle commonly used in the literature. Obviously, this solution makes use of the fact that in English these expressions are more like descriptions than proper names, which is not necessarily the case in Frege's original German[7]. In German, the planet Venus shares its proper name with the German poet Christian Morgenstern, and it is not clear that the name for the planet has constituent structure in the logical

[5] The quote was changed from "co-denotational" to "co-referential" as "denotation" is used in this thesis exclusively for descriptions, which are about objects without referring to them, by referring instead to objects, properties and relations that in some way apply to the denotation. For example, at the time of writing, "the current president of the United States" denotes Obama while referring to the United States and the property of being a president, and the description denotes Obama because Obama is the president of the US at the time of writing.

[6] As so often, the metaphysical and the epistemological order of explanation have to be distinguished. Co-referential beliefs can be distinct mental states because concepts can be distinct even if co-referential, but the assumption that concepts can be distinct even if co-referential is based on the knowledge that co-referential beliefs can be distinct mental states.

[7] This is true even if Frege actually used "Eigenname" indiscriminately for proper names and denoting descriptions.

form anymore than the name for the poet does. Anyway, since Fodor accepts that Frege's Puzzle is real, the issue is an insubstantial debate about which variants represent the real Puzzle for Fodor. Fodor realizes that such a strategy does not go very far, and that he has to face the fact that CICERO and TULLY are type-distinct concepts, as are PHOSPHORUS and HESPERUS:

> "If there is a Frege problem, it must be about how to draw the type/token relation for (syntactically) primitive concepts."
> (Fodor 2008: 75)

Such concepts cannot be distinguished by their constituent structure nor their reference, as they do not have the former while sharing the latter. So Fodor recognizes that Frege's Puzzle constitutes a serious challenge to Referentialism in the form of the type-identity problem for primitive co-referential concept tokens. The next section considers possible Referentialist responses to Frege's Puzzle for the Language of Thought.

5.2.3 Possible Responses

This section considers four possible Referentialist responses to Frege's Puzzle for the Language of Thought. Two of the responses are due to Fodor, and the other two are offered on Fodor's behalf by Laurence and Margolis (2007) and Sainsbury and Tye (2011). As will become evident, only Laurence and Margolis' proposal appeals to semantics to address the Puzzle, while the other proposals make use of non-semantic properties to distinguish co-referential but type-distinct thoughts and concepts. Even so, all proposals share the objective of avoiding a Fregean sense theory[8]. The section starts with Fodor's attempts to avoid a Fregean two-tier semantics. Fodor's first and unsuccessful strategy consists in dismissing the significance of Frege's Puzzle for the Language of Thought. Fodor's second attempt represents his level-headed approach to the problem that consists in appealing to the syntax of thoughts to solve the Puzzle. It is explained, however, that Fodor's second proposal fails as well, as it is unable to solve all variants of the Puzzle. Subsequently, the section discusses two possible ways to amend a Referentialist semantics to provide a more widely applicable response to the Puzzle, but it is argued again that the proposals fail for some variants of the Puzzle. The main outcome of this section is therefore that all the proposed Referentialist semantic theories fail to provide an adequate solution to Frege's Puzzle for the Language of Thought as they can only can solve some but not all of the variants of the Puzzle.

5.2.3.1 Ceteris Paribus

The ceteris paribus strategy is Fodor's first attempt to defend a Referentialist semantics in view of Frege's Puzzle:

> "Intentional psychology is a special (i .e., nonbasic) science, so its laws are ceteris paribus laws. And ceteris paribus laws tolerate exceptions, so long as the exceptions are unsystematic. Exceptions don't disconfirm ceteris paribus laws though, of course,

[8] Put this way, the Semantic Relationist shares this objective of avoiding a Fregean sense theory. However, the non-semantic solutions evidently aim to avoid a two-tier semantic theory more generally, which is of course not true for the Relationist. Whether it is true for Laurence and Margolis as well is not altogether clear, as will be shown momentarily.

> counterexamples do. So the question whether intentional laws are broad turns not on whether there might be Frege cases, or even on whether there are Frege cases. The sole issue is whether such Frege cases as there turn out to be should be treated as the consequences of failures of ceteris paribus clauses to be satisfied."
> (Fodor 1994: 39)

Fodor's basic idea is very simple. Psychological laws admit of exceptions, and Frege cases are such exceptions. As a consequence, there is no need to invoke a richer semantic theory to "solve" Frege's Puzzle for the Language of Thought. This section considers this strategy, if only briefly, as Fodor apparently has since abandoned it (Heck 2011: 4, footnote 4). The reason to include it nonetheless is that a version of the view has recently been adopted by Schneider, who maintains that "including [such] cases in the ceteris paribus clauses is justified", and that "Frege Cases [are] tolerable exceptions, rather than counterexamples" to psychological laws that involve types individuated purely by referential content (Schneider 2005: 445)[9]. As does Fodor, Schneider speaks in this context of broad intentional laws, which is just a terminological variant of the idea that laws are based on concepts, thoughts and beliefs that are individuated by a purely referential notion of content (Schneider 2005: 426).

Heck raises two major problems for this view[10]. Heck's first objection is based on the following observation about the ceteris paribus strategy in view of Frege's Puzzle:

> "Fodor's proposal that we should simply deny that there is any cognitive explanation to be given in such cases - that such cases are, in some sense, pathological. We shall see that this response is every bit as desperate as it seems"
> (Heck 2011: 4)

As explained, Fodor's basic point is that even true psychological laws admit of possible exceptions. One can take as an example a putatively true law that states that people tend to drink water when they are thirsty. It is possible, however, that a subject does not conform to his law, for instance because of some idiosyncratic belief that water can cause immediate death (unlike drinks that, as a matter of fact, also contain water). The reason this is tolerable in view of the truth of the putative law is that the subject represents an exception due to an unusual belief that functions as defeating parameter. It is thus possible to uphold the ceteris paribus truth of the law despite the exceptional occurrence of a case that appears to disconfirm it. According to Heck, however, Frege cases are not like that. If an Ancient Greek does not go out in the morning to see Hesperus, even though according to Referentialists such as Fodor and Schneider the Greek believes something to the effect that Hesperus is visible in the morning by virtue of believing that Phosphorus is visible in the morning, which on a Referentialist semantics has the same content as the belief that Hesperus is visible in the morning, the reason is not an unusual defeating belief, say the a belief that heavenly

[9] The reason the section is nonetheless short is that, confusingly, Schneider appears to have since abandoned the view as well (Schneider 2009b). In her latest contribution, she opts for a different view (cf. the next footnote).

[10] Heck is not the first to call into question the ceteris paribus strategy, however, Aydede is (2001). Heck also points out that while Schneider's version differs from Fodor's in detail, it does not do so in a way that avoids his objections (Heck 2011: 5, footnote 10). Heck further mentions in the same footnote that Schneider's "view is in many ways similar in spirit to mine", which presumably refers to the more recent view developed by Schneider (2009b). Schneider's basic idea there is that concepts in fact do not have to be shared, but only certain relations between them, which is similar to Heck's appeal that the relevant sameness is in terms of the "formal relations" between concepts. Like Heck's proposal, Schneider's proposal is thus defective because it fails to realize that both the truth and the applicability of psychological laws have to be accounted for in Frege cases.

bodies are not visible on that particular day of the week. Obviously, the reason is rather that the Ancient Greek wants to see Hesperus but does not believe Hesperus to be visible in the morning. Moreover, this belief is hardly idiosyncratic. In fact, the belief that Hesperus is not visible in the morning was universally held by the Ancient Greeks, as they did not know that Phosphorus and Hesperus are the same heavenly body. Accordingly, Heck points out that this and similar behavior is systematic enough to warrant psychological explanation, and so it cannot be considered:

> "from the point of view of psychology, anomolous, which is to say that [it] fall[s] outside the domain of psychological explanation."
> (Heck 2011: 5)[11]

The second and even more serious objection Heck raises is that the strategy does not allow for informative identity thoughts. The reason is that each informative identity thought is identical in content to an uninformative correlate, which is obviously true. As a result, the fundamental psychological capacity of object recognition is no longer within the realm of psychological explanation:

> "[O]n Fodor's view, my arriving at [an informative] identity judgment cannot be regarded as a psychological phenomenon admitting of a psychological explanation. But the discovery of such identities is characteristic of object-recognition and so is an almost pervasive feature of human cognition. It would be well beyond desperate to banish such recognition from the realm of psychological explanation."
> (Heck 2011: 6)

Heck's point is based on a similar argument from Aydede and Robbins (2001). Many co-referential yet distinct thoughts and beliefs are involved in prima facie rational thought processes, including instances of practical reasoning and rational behavior. On account of this, exceptions to the laws have to be considered deviations from the norm of rationality. Such exceptions are certainly possible, as people often enough fail to do what is most rational for them to do. However, it is not plausible to argue that Frege cases are such exceptions. How can it possibly be irrational not to go out in the morning to observe Hesperus if one simply does not believe that Hesperus is visible in the morning? How can this be considered irrational if one does not know that the heavenly body visible in the morning is in fact Hesperus? Aydede and Robbins reasonably suggest that this view can only be maintained on "an externalist notion of rationality", which takes into account actual facts rather than what is known to an agent (2001: 15). The problem is that an externalist notion of rationality is not adequate for the purpose of psychological explanation, however, as it will classify too many subjects as irrational, even outside of Frege scenarios (Aydede and Robbins 2001: 16). Evidently, on an external conception of rationality, any subject short of omniscience will regularly count as irrational. Any subject will often display highly erratic behavior in that case, despite the fact that the behavior is in fact perfectly reasonable given what the subject knows. It is also safe to assume that Fodor could not accept an externalist notion of rationality, as the Language of Thought based computational approach to the mind would then no longer explain how rationality is possible in the physical world based on the "line of thought [that] assessments of rationality are

[11] Fodor at times dismisses fictional examples simply because they are fictional. The Ancient Greek case shows that real cases exist, which makes it clear that fictional cases are used merely for vividness and convenience. Fodor therefore dismisses such cases for the wrong reasons. This is not to advocate in favor of thought experiments, however. Fictional cases are just cases that are representative of real cases but make the crucial issues clearer. For instance, the behavior towards Superman and Clark Kent in a fictional scenario is more obviously distinct than the behavior towards Hesperus and Phosphorus in the real Ancient Greek scenario, but the core issue is still exactly the same.

[...] sensitive to the syntactic form of (e.g. mental) representations" (Fodor 2008: 63, 75). The reason is that rationality as physically realizable in a system can only depend on factors accessible to the system, which is a point Fodor stresses repeatedly. Computational processes can thus not account for rationality in the way Fodor claims on an externalist notion of rationality.

5.2.3.2 The Syntactic Solution

The passage in which Fodor recognizes the relevance of Frege's Puzzle quoted above in fact continues as follows:

> "If there is a Frege problem, it must be about how to draw the type/token relation for (syntactically) primitive concepts. But if there is a Frege problem about primitive concepts, then it is resolved by appeal to their form, not by reference to their content."
> (Fodor 2008: 75)

Even more specifically, Fodor claims:

> "Philosophers [...] have held that Frege cases are convincing arguments that concepts have not just referents but also senses. [...] Frege cases show that there must be something more to the individuation of concepts than what they refer to. But it doesn't follow that the relevant something more is the concept's sense or even that it is a parameter of the concept's content."
> (Fodor 2008: 56)

Fodor's basic idea is that co-referential concepts are like different words that stand for the same object. So just as the word "Hesperus" differs in shape from the word "Phosphorus", their corresponding mental representations differ in form as well. In other words, co-referential concepts are syntactically distinct mental symbols which share the same referential content. Ultimately, saying that such concepts are distinct mental symbols is to say that they are encoded differently by the brain, which makes them physically distinct objects[12]. In this sense, Fodor speaks of co-referential concepts such as PHOSPHORUS and HESPERUS as "different syntactic objects" (Fodor 1998: 39). The key idea is that syntax is sensitive only to the form and not the content of symbols. This means that the difference between co-referential concepts is a difference on the syntactic level. Co-referential expressions are distinct prior to, and so independent of, their semantic content. The crucial point then is Fodor's idea that Frege's Puzzle for the Language of Thought can be solved syntactically, which renders a Fregean sense theory redundant:

> "[S]yntax can do what senses were traditionally supposed to do; that is, it can distinguish coextensive representations."
> (Fodor 2008: 61)

For Fodor, this is actually just one example of his broader strategy, if arguably the most important one:

> "The rule of thumb: If there's something that it seems that you need senses to do, either do it with syntax or don't do it at all."
> (Fodor 2008: 87, footnote 56)

[12] The physical difference between them can be represented abstractly by a differing sequence of 0's and 1's.

In view of the pertinence of Frege's Puzzle for the type-identity of Language of Thought symbol tokens, Fodor's idea is thus that two symbol tokens can count as being of the same type if they are encoded in the same way, and different if not. All HESPERUS tokens have the same form within a cognitive system, which form is distinct from the form of all PHOSPHORUS tokens. On this basis, the identity thought, say, HESPERUS IS HESPERUS can be distinguished from the identity thought HESPERUS IS PHOSPHORUS by a cognitive system as well, given that the former contains a given symbol twice, while the latter contains two distinct symbols. The general advantage of this response to the Puzzle is obvious enough:

> "[S]yntax costs a lot less than senses, metaphysically speaking, since postulating a syntactically structured [Language of Thought] has independent justification however Frege cases turn; as we saw above, constituent structure is required to account for the systematicity/productivity of thought."
> (Fodor 2008: 61)

Fodor's main point is that syntactic properties are required anyway, so his reasonable question is why not use them to avoid postulating semantic notions in addition to reference. It is clearly advantageous to have a theory that postulates less theoretical entities while having the same expressive power as a potential alternative. The availability of such a theory manifestly calls into question the very existence of the additional theoretical entities posited by the alternative theory. The condition is evidently that the explanatory power is indeed the same for both theories, which, as is shown momentarily, is actually not the case for Fodor's syntactic proposal and Frege's semantic proposal.

The fact that the thought HESPERUS IS HESPERUS differs syntactically from HESPERUS IS PHOSPHORUS was mentioned as an example of the syntactic response to Frege's Puzzle. For Fodor, these thoughts represent different syntactic vehicles that express the same proposition. Both thoughts have exactly the same content, but they represent that content in a syntactically different way. The uninformative identity represents the proposition by means of a repeated symbol, while the informative identity represents the same proposition by means of two distinct symbols. To begin with, this view can clearly account for the fact that it is possible to believe one but not the other, even if they have the same content, as they are distinct thoughts to which a subject can have different propositional attitudes. Moreover, a person can also have an explicit propositional attitude only towards one of them, and not the other. Finally, the proposal accounts for the fact that an agent is not irrational if the agent fails to go out in the morning to see Hesperus, because inferences for Fodor generally depend on contents being presented in the right syntactic way:

> "[A]ssessments of rationality are [...] sensitive to the syntactic form of (e.g. mental) representations."
> (Fodor 2008: 75)

Fodor suggests that rationality depends not only on the content, but also on the syntactic form of the attributed beliefs and desires. Accordingly, while an agent may believe the content that Hesperus is visible in the morning by virtue of believing that Phosphorus is, this content cannot be appropriately connected to the desire to see Hesperus, as it is presented by means of an inferentially inappropriate Language of Thought symbol. This explains why it will not cause the relevant behavior. The content of the desire and the content of the belief are such that the behavior would be appropriate, but they are nonetheless not conducive to the behavior as they are not connected

in the right symbolic way[13].

Fodor's view also has some counter-intuitive consequences, though. For instance, the content of beliefs is then no longer transparent. An Ancient Greek, for example, will be taken to believe something with the content that Hesperus is visible in the morning, but this Greek will not know that he or she believes this, and will in fact deny believing it when asked. This is not an intuitive way of thinking about the content of beliefs. It is important to note, however, that Fodor is well aware that this proposal is counter-intuitive in assigning the same content to distinct but co-referential thoughts. Fodor is simply skeptical about intuitions in this regard:

> "I have come to think that the Frege argument for senses rests on nothing but appeals to intuitions; if so, that is itself a reason for viewing it askance. What's so good about saving intuitions?"
> (Fodor 2008: 16)

This skepticism is not unreasonable. Notions such as belief and content are highly theoretical concepts, and so pre-theoretic intuitions regarding them should not be valued too highly. Moreover, Fodor assumes that the advantages of his proposal outweigh the disadvantages. Fodor therefore tolerates the counter-intuitive results. Unfortunately, Fodor is mistaken in this regard, as it turns out that Fregeanism does not depend only on intuitions, and that the disadvantages of Fodor's view are worse than he realizes.

The greatest stumbling block to a Referentialist semantics for the Language of Thought are interpersonal or intersubjective Frege cases, as again highlighted first by Aydede (1998). Even so, the presentation here is based on the more accessible discussion offered by Laurence and Margolis (2007). Laurence and Margolis discuss the issue using the example of the famous author George Orwell, who's real name is Eric Blair. The example considers a person called Bob who happens to be a neighbor of Orwell/Blair. Bob does not know much about his neighbor Blair, only that he is a writer and ostensibly not a very successful one. He also knows of the famous writer called Orwell, but he fails to realize that his neighbor is in fact the famous author known as George Orwell. On Fodor's view, Bob thus has two distinct concepts, ORWELL and BLAIR, which are two distinct symbols in Bob's Language of Thought. This explains how they can be involved in different beliefs. For instance, Bob believes that Blair is his neighbor, but not that Orwell is. Bob also believes that Orwell is a famous author, but he believes that Blair is not. Since both concepts are co-referential, this represents a variant of Frege's Puzzle, and Fodor's basic response is to distinguish the concepts by what Laurence and Margolis aptly call their "mental orthography" (2007: 583).

The intersubjective variant of the Puzzle arises when a second person is introduced, Anne, who only knows of Orwell as the famous author called George Orwell. In that case, it is clearly true to say that both Bob and Anne believe that Orwell is a famous author. Bob and Anne share the belief that Orwell is a famous author. The reason is that Anne has a concept for Orwell that corresponds to Bob's ORWELL concept, and her concept is involved in a similar belief as Bob's

[13] Although one can agree with Fodor that rationality is partly a matter of syntax, it is less plausible to assume that folk assessments of rationality are. In other words, common people arguably take the behavior of the Ancient Greeks failing to go out in the morning to be rational because they think that beliefs about Hesperus differ in content from beliefs about Phosphorus. A Relationist and a Fregean can accommodate this, but a Referentialist such as Fodor cannot, which explains why he claims that common people assess rationality by means of both the semantic content and the syntactic vehicles of beliefs and desires, which seems empirically rather dubious. Even so, the underlying explanation of behavior in terms of the syntactic properties of beliefs and desires is still plausible.

to the effect that Orwell is a famous author. The problem then for Fodor is that on his view this true claim about what Bob and Anne both believe cannot be properly motivated. The reason is that Fodor cannot explain why Anne's ORWELL tokens should be identified with Bob's ORWELL tokens rather than with his BLAIR tokens[14]. Thus Laurence and Margolis:

> "Fodor only has orthography and reference to work with. He can't say that one of Bob's concepts - the one associated with "George Orwell" - is the same as Anne's [...]. According to Fodor's theory of modes of presentations, the concept of Bob's that is associated with "Eric Blair" has an equally good claim to being the same concept as Anne's. The result is that while mental orthography alone may distinguish concepts intrapersonally, it seems insufficient for dealing with interpersonal cases."
> (Margolis and Laurence 2007: 586)

The problem is the following. All the concept tokens in question have the same reference, so that reference cannot be used to identify Anne's ORWELL tokens with Bob's ORWELL tokens while distinguishing them from his BLAIR tokens. And the additional fact that Bob's ORWELL and BLAIR concepts are different symbols in Bob's Language of Thought is of no help either. It is of no use in determining the intersubjective type-identity of mental symbols. However, without an adequate criterion for intersubjective type-identity, Fodor has no basis for the obviously true claim that Bob and Anne share the thought that Orwell is a famous author. In fact, on Fodor's proposal it would be equally possible to claim that Bob and Anne have contradictory beliefs about Orwell, in the sense that Anne believes that Orwell/Blair (as "Orwell") is famous, while Bob believes that Orwell/Blair (as "Blair") is not famous.

Moreover, by general consensus Fodor is barred from claiming that the ORWELL tokens in both Bob and Anne are constituted by the same symbol in the way that they are within Bob or Anne. Fodor cannot claim that all ORWELL tokens within both Bob and Anne are physically identical[15]. The reason is the universally accepted principle that content is multiply realizable, which entails that it is not at all necessary for a content to be universally realized by means of the same symbol. Combined with the fact that there are very many possible symbols by which a content can be realized, this makes it very unlikely that the same content is realized by the same physical symbol in two distinct subjects[16]. Most probably, the tokens that realize a shared content will thus be physically distinct within different subjects. And even two subjects happen to share a symbol for a content by sheer coincidence, adding additional subjects will bring down the probability of a universally shared symbol to zero very rapidly. The upshot is that syntactic identity cannot serve as a criterion for intersubjective type-identity either. Hence, Laurence and Margolis conclude:

> "[M]ental orthography is too weak to serve the function associated with modes of presentation, since mental orthography can't deliver conditions of interpersonal individuation."
> (Margolis and Laurence 2007: 584)[17]

[14] As before, the argument that the concepts can be typed by the associated public name is not considered here, as the same argument can be made using a single name, as in Kripke's famous Paderewski example or the example of Chomsky used by Laurence and Margolis (2007: 583)

[15] Fodor does not in fact dispute this, and he has never suggested this idea.

[16] As mentioned, for Gallistel and King the availability of a vast amount of mental symbols is in fact major evidence for the symbolic approach to the mind, as the Language of Thought allows for what Gallistel and King call "compact symbols" (2009).

[17] See also Aydede (1998: 293).

Why is the lack of adequate intersubjective concept individuation a major concern, though? An initial problem was already mentioned. While Bob and Anne evidently share a belief to the effect that Orwell is a famous writer, Fodor's proposal cannot underwrite this claim. Nothing in Fodor's proposed theory accounts for the fact that the claim is true, and that its opposite, the claim that they have contradictory beliefs in this respect, is not. The greater concern is that the example represents just one example of a general failure of the theory to adequately type concepts, and hence thoughts and beliefs, across thinkers, which adversely impacts all theories based on these notions. One example is the theory of linguistic communication. One can suppose, for instance, that Anne communicates to Bob the thought that Orwell's latest book is great, which Bob understands as the thought that Blair's latest book is great. In other words, Bob interprets Anne as having spoken about his neighbor, when in fact she intended to speak about the famous author. Clearly, any adequate theory of linguistic communication has to count such a linguistic interaction as unsuccessful, as Bob evidently misunderstood what Anne tried to communicate to him. However, this can only be established if it is possible to properly type-identify Anne's ORWELL tokens with Bob's ORWELL tokens, and type-distinguish them from Bob's BLAIR tokens. Without an adequate criterion for the type-identity of mental symbols, there is no basis for the claim that in such cases the linguistic interaction was not successful. As a consequence, the resulting theory of linguistic communication will be deficient.

Incidentally, this shows that the claim co-reference is enough for successful communication cannot be upheld, even if suggested surprisingly often in the literature (Sosa 2010: 355, for instance). The claim that co-reference is sufficient is made mostly in the context of Fregean views on which senses contain substantial information about the reference in order to make the point that no shared description or mode of presentation for a reference is necessary to communicate successfully about an object. While the general point that sameness of descriptive information is not necessary is correct, it does not follow that co-reference is sufficient, nor is it true. It should in fact be obvious that co-reference is generally not sufficient for successful communication, if else an Ancient Greek forming the thought that Hesperus is a star would count as having properly understood another Ancient Greek who expressed the thought that Phosphorus is a star, despite the fact that neither of them knows that Hesperus is Phosphorus. Hence, while it is perhaps true that co-reference is what speakers care most about in communication, and that it is necessary for successful communication, it is not still not sufficient[18]. Hence, a Referentialist such as Fodor needs a proper way to type co-referential concepts across subjects for an adequate theory of linguistic communication, which, however, Fodor fails to provide.

A second worry regarding the proper intersubjective type-individuation of concept tokens concerns the availability of psychological generalizations. For the sake of argument, one can imagine that it is a true generalization that all people believe Orwell to be a successful writer. Intuitively, Bob conforms to this law, as he believes what he would express by saying that Orwell is a successful writer. However, this requires that his ORWELL tokens can be properly type-identified with those of the rest of the community, because if the concepts of the community are identified with his BLAIR tokens instead, Bob in fact contradicts the law. As noted before, the law admits of exceptions, and no belief is perhaps universally held, but even so Bob would still contradict the putative law

[18] Taschek makes a similar point (1998: 348, footnote 28). That co-reference is manifestly not enough in general presumably explains why Sosa hedges his claim even while making it: "I don't claim it is ultimately correct [...]" (Sosa 2010: 355).

for the wrong reasons. Bob would represent a counter-example to the law that all people believe Orwell to be a successful writer because of the (for him unrelated) belief about his neighbor and despite his explicit belief that Orwell is a successful writer. This clearly shows that Bob should be taken to corroborate the truth of the law, which requires that his ORWELL tokens are properly type-identified with those of the other people subsumed by the generalization.

Such psychological generalizations aim to establish general empirical truths of a psychological and sociological nature, but they also serve in the causal explanation and prediction of behavior. To see this, one can imagine that a further psychological truth about people is that they all desire autographs from famous authors. This yields the predication that people will generally approach whoever they consider a famous author. The problem then is that without a proper way to align Bob's concept tokens with those of the public at large, Bob is again taken to falsify this predication as he will not approach his neighbor for an autograph, despite his wish to have an autograph of Orwell and his belief with the content that Orwell is his neighbor.

Admittedly, these examples are not even remotely characteristic of actual research in psychology and cognitive science. However, they are toy cases that are exemplary of actual psychological research into topics such as belief systems and their adaptation in the face of sensory data, inferential reasoning, practical reasoning and the causation of behavior, object recognition, and the like, which are all based on the idea that thoughts and beliefs can be shared. The same point is true for linguistics as well. Frege's Puzzle may not be a major concern in linguistic research, but linguistic theories are nonetheless predicated on the idea that thoughts are shared. This in turn requires that the Puzzle can be successfully addressed, which Fodor's proposal fails to do. That way, the toy examples show that Fodor's theory of mental content does not meet the requirements of actual psychological and linguistic research.

In summary, there are two ways to respond to a problem within Fodor's framework, following the dictum quoted earlier:

> "The rule of thumb: If there's something that it seems that you need senses to do, either do it with syntax or don't do it at all."
> (Fodor 2008: 87, footnote 56)

Hence, one can either appeal to the sameness of syntactic vehicle as a universal criterion for type-identity in addition to reference ("do it with syntax"). In that case the proposal fails, as shared concepts are not generally realized by identical vehicles in distinct cognitive systems, even if it can happen occasionally. Or one can refrain from offering any criterion for intersubjective type-identity ("don't do it at all"). In that case, the proposal also fails, as it cannot account for successful linguistic communication and true psychological generalizations. Either way, Fodor's syntactic response to the Puzzle is inadeqaute, which shows that his defense of a Referentialist semantics for the Language of Thought in view of Frege's Puzzle is not successful.

It should be noted that this problem affects all proposals that rely on the idea that it is sufficient to maintain that co-referential beliefs represent distinct mental states with the same content in response to Frege's Puzzle for belief. Whatever distinguishes these mental states intrasubjectively will not be available to adequately type-identify them intersubjectively. This includes pragmatists such as Soames who claim that Fregeanism is redundant because co-referential beliefs can be considered distinct beliefs that express the same propositional content (Soames 1995). It most likely

includes Heck's proposal as well (Heck 2011). It was explained how Heck aims to solve Frege's Puzzle by positing "formal relations" between mental representations (Heck 2011: 44). Admittedly, it is not immediately obvious whether these formal relations can also hold between the mental representations of different thinkers, as would be necessary in order to solve the intersubjective variant of Frege's Puzzle. Certainly nothing Heck says in the paper suggests that they could, and what he says rather suggests the opposite. For one, Heck explicitly contemplates only formal relations between the mental states of individual thinkers. Moreover, the name of the relation clearly suggests that it has to do with the form of beliefs and other mental states, which indicates that they are part of the syntax of these states (Heck 2011: 40). Heck actually agrees with Fodor that beliefs most likely have a syntax, which is why he thinks it is plausible to assume that the formal relations between mental representations are in fact due to the intrinsic syntactic properties of those mental representations (2011: 22). More generally, he maintains that they are due to the way mental states are implemented (2011: 27). This indicates that Heck's proposal is of the same general kind as Fodor's. At best, it yields conditions for what Fine calls "weakly de dicto" correct attributions of belief (2009: 103). In other words, it can only take into account how concepts are interrelated within individual thinkers, but not how these concepts are interrelated with the concepts of other thinkers, which is precisely what is needed to address the intersubjective variant of the Puzzle. It is true that Heck endorses the claim that "formal relations" are based on implementational or syntactic properties only tentatively. However, he indicates no possible alternative either. Moreover, Heck is arguably cautious for other reasons. Firstly, he wants to make his response to the Puzzle independent of the Language of Thought or any other determinate view on the implementation of thoughts and beliefs (2011: 23, footnote 43). Secondly, he thinks that an appeal to syntactic properties undermines the fact that psychological laws subsume mental states by their content (2011: 22-23). This, however, was shown to be based on a confusion between the truth and the applicability of psychological laws[19]. It is thus reasonable to assume that Heck's reluctance to fully commit to a syntactic understanding of his notion of a formal relation is not related to the issue that they have to be intersubjectively applicable. Hence, it is fair to conclude that at the very least, Heck's proposal lacks the necessary elaboration, but that on the most natural way to interpret his proposal, it fails for the very same reason as Fodor's.

Intersubjective Frege cases are the reason why Fodor is wrong to claim that Fregeanism is based purely on intuitions. Prima facie, a Fregean has a ready response to Fodor's conundrum. For a Fregean, Anne's ORWELL tokens share a sense with Bob's ORWELL tokens, but not with his BLAIR tokens[20]. In return, Fodor may reasonably ask what it means to say that these tokens share a sense or a mode of presentation, and why Anne's ORWELL tokens share a sense with Bob's ORWELL tokens but not with his BLAIR tokens. These are different issues, though, for which the Fregean is perhaps unable to provide a substantial answer. However, that does not change the fact that a Fregean has at least the necessary theoretical tools to address the intersubjective variant of Frege's Puzzle, in contrast to the Referentialist[21]. Before considering a possible Fregean response

[19] It is also not clear why Heck thinks that unlike formal syntactic properties, formal relations do not face the problem he sees. And while Heck is correct that syntactic properties are not enough to account for the availability of psychological laws, this is not for the reason Heck mentions. The real reason is instead that syntax, whether in the form of relations or properties, cannot explain why some syntactic objects but not others speak to the truth of the laws.

[20] In that case, it is of course no longer possible to claim that senses as modes of presentations are entirely based on syntactic vehicles, which is something that was suggested as a possibility for the Fregean, as intersubjective sameness of sense will not generally be due to an identical vehicle.

[21] This reflects Sainsbury's admission that senses are not explanatory in any substantial way.

to the Puzzle, however, first two alternative proposals that share Fodor's aim of avoiding a two-tier semantic theory. The first proposal is due to Laurence and Margolis (2007).

5.2.3.3 Inferential or Conceptual Role

Laurence and Margolis start by providing an in-depth analysis of the shortcomings of Fodor's Referentialist proposal and then offer the following way out for Fodor:

> "We believe that the best way for a theorist like Fodor to respond to these difficulties is to recognize a place for conceptual role without taking it to be constitutive of concepts."
> (Margolis and Laurence 2007: 586)

The basic idea is to type concept tokens by their conceptual role. In the example of Blair and Orwell, the relevant role could for instance be that of being a famous author, which Bob associates with Orwell but not Blair. According to Laurence and Margolis, such a conceptual role can thus be used to type-identify ORWELL tokens. Promisingly, this works intrasubjectively as well as intersubjectively.

In the quoted passage, Laurence and Margolis stress the non-constitutive function of conceptual roles for concepts. The main motivation for this is to avoid Semantic Holism, which has the well-known drawback that it either relies on an untenable analytic-synthetic distinction or else makes concepts so fine-grained that they can no longer be shared between subjects. The first results if one makes some beliefs that include a concept constitutive of that concept's semantic content but not others, while the second arises if one makes all the beliefs that contain a concept constitutive so as to avoid the first outcome. As a corollary, this shows that Laurence and Margolis do not have a two-tier semantic proposal in mind. Laurence and Margolis do not consider conceptual role part of the content of concepts, and so conceptual role does not represent a level of content in addition to reference. It follows that Laurence and Margolis propose to type-identify concept tokens by their semantic features, but not their content alone. Accordingly, the resulting proposal is instrumentalist in the sense that type-identity over and above co-referentiality is largely discretionary:

> "[W]e say that, strictly speaking, there is no determinate fact as to which of Bob's co-referential concepts is identical to Anne's, [but] we can still explain the interpersonal similarities and differences that these concepts engender."
> (Margolis and Laurence 2007: 586)

An initial worry with this proposal is that it can account for the truth of psychological laws, but in the wrong way. A possible true empirical generalization, such as that everyone believes that Orwell is a famous author, will turn into something akin to a conceptual truth, the truth of which depends entirely on the preferred way of describing reality. Such a true psychological law no longer captures an independent and interesting fact about empirical reality, but rather testifies to a theorist's good choice in picking a criterion in determining conceptual identity. In other words, the truth of such laws depends less on empirical reality and more on a theorist's way of carving it up. As a result, laws involving beliefs about Orwell are true primarily not because of what is actually believed about Orwell, but rather because of the way the beliefs about Orwell are chosen to be categorized. In addition, this makes many true laws self-evident. For instance, it is no longer an interesting empirical fact that everybody believes that Orwell is a famous author if concept tokens that refer to

Orwell/Blair as ORWELL tokens are type-identified on the basis of the conceptual role of being a famous author. It is evidently possible to pick a different conceptual role to reinstate the empirical nature and informativeness of any specific law, but there will always be one law that remains incorrectly characterized by virtue of the fact that it involves a concept's conceptual role[22].

An even more substantial problem concerns the fact that the proposal does not work as a general solution. It is intuitively plausible to appeal to conceptual roles to distinguish between ORWELL and BLAIR tokens. The same is true for other examples used in the literature, such as Superman and Kent. Superman is a superhero with an ability to fly, which is a very distinctive characteristic of Superman. Accordingly, SUPERMAN tokens can easily be demarcated from KENT tokens by virtue of a suitable conceptual role. Yet despite being convincing for these examples, it is not hard to think of counterexamples. Fodor, for example, offers the case of two people who know about a painter called Jackson and a painter called Pollock, and who think these are two distinct people, but who know nothing else about either Jackson or Pollock (Fodor 1998: 16). In that case, Laurence and Margolis' proposal fails, as there is no suitably different conceptual role that can used to properly demarcate JACKSON and POLLOCK tokens. Since the two subjects in Fodor's example believe nothing about one painter they do not also believe about the other, there is no conceptual role that is distinctively associated with only one of the concepts. However, even if the concepts share both their reference and their conceptual role, they represent tokens of distinct concept types, which can potentially be contained in different beliefs even if they are not in the case as described by Fodor. Accordingly, it cannot be doubted that JACKSON and POLLOCK tokens constitute distinct mental symbols in the Language of Thought of the two subjects[23].

In fact, there are even worse examples for Laurence and Margolis. One can imagine a scenario in which a person A believes that Hesperus is a star but that Phosphorus is not, which beliefs he aims to pass on to his pupils B and C. These pupils have never heard of either Hesperus or Phosphorus before. And while B is very credulous, believing everything she is told by A, C is the exact opposite, paranoid to the extent that he always believes the contrary of what A tells him. The outcome in this scenario is that after being instructed by A, B will believe that Hesperus is a star and Phosphorus is not, while C will believe that Hesperus is not a star, but that Phosphorus is. Evidently, B and C will thus arrive at antithetical beliefs as a result of their diametrically opposed epistemological attitudes towards A. On the theory proposed by Laurence and Margolis, however, B and C will in fact incorrectly count as having the same beliefs. Type-identifying token concepts by conceptual role, which in this case can only be based on whether the heavenly body is believed to the a star or not, A and B's HESPERUS tokens will be type-identified with C's PHOSPHORUS tokens, and all three will be taken to share a belief involving this putative concept type. The same holds true for A and B's PHOSPHORUS tokens and C's HESPERUS tokens as well. As a result, B and C will be characterized as having identical beliefs on Laurence and Margolis' proposal, while in fact they have diametrically opposed beliefs.

In conclusion, there are two types of cases that undermine Laurence and Margolis' proposal. The first type of case shows that the proposal fails to provide a universally adequate answer to the type-identity of concept tokens, while the second type shows that at times it even provides the wrong

[22] Despite appearances, however, falsifiability is not a concern. Even the laws that include the conceptual role can be false because the conceptual role is not constitutive of the identity of the concept.

[23] To repeat, the view that such concepts differ in terms of associated public name is ignored here, as cases can easily be imagined with a single name, the use of which is avoided in the literature and here for the sake of clarity.

answer. The underlying reason is that sameness of inferential or conceptual role, however ultimately defined, is neither sufficient nor necessary for conceptual identity. As a result, the extension of type-identical concept tokens does not overlap with the extension of co-referential tokens that share a conceptual role. For that reason, type-identity cannot generally be based on co-referential concepts tokens sharing a conceptual or inferential role. Conceptual role is not a suitable criterion for the type-identity of concepts tokens. Laurence and Margolis' proposal is therefore inadequate to defend Fodor's Referentialist semantics for the Language of Thought against Frege's Puzzle.

5.2.3.4 Originalism

An alternative option to save Referentialism from the intersubjective Puzzle can be found in Sainsbury and Tye (2011). Sainsbury and Tye first stress that co-referential concepts differ in concept rather that content, which amounts to saying that co-referential concepts are distinct vehicles with identical content:

> "We claim that the work supposedly done by difference of sense can be done better by difference of concept. [...] [W]e think one should not appeal to mysterious difference of sense when one can instead appeal to the clearer notion of difference of concept."
> (Sainsbury and Tye 2011: 117)

Sainsbury and Tye thus share Fodor's anti-Fregean view that the difference between co-referential concepts is in form rather than content, and they do so for very similar reasons (Sainsbury and Tye 2011: 117). The interesting addition of their view is the way they propose to identify concepts:

> "[C]oncepts have clear identity conditions based on their origin"
> (Sainsbury and Tye 2011: 117)

The key idea of what Sainsbury and Tye call their Originalist proposal is that "concepts should be individuated by their origins" (Sainsbury and Tye 2011: 101). In other words, two concept tokens count as type-identical if they share their origin.

The basic idea is best explained by means of the example about Hesperus and Phosphorus that was problematic for Laurence and Margolis' proposal. On Sainsbury and Tye's account, both B and C's HESPERUS tokens will count as type-identical because they share their origin in A's mental representation for Hesperus, in the sense that they are both caused by A's representation for Hesperus by virtue of their linguistic interaction with A. The same is true for the B and C's PHOSPHORUS tokens as well. Unlike the previous proposal, the theory can thus correctly say that B and C have diametrically opposed beliefs about Hesperus and Phosphorus.

Even so, the proposal can be undermined by following a similar strategy as before, which consists in showing that there is a difference in extension between concept tokens that are type-identical and concept tokens that have the same origin. In other words, the proposal will fail for cases where concepts of the same type have a different origin as well as cases where concepts of different types have the same origin. The first type of case can be found in Millikan's response to Sainsbury and Tye (Millikan 2011). Millikan has scenarios such as the following in mind. The example involves a person A who forms a singular concept of a man she sees everyday crossing the street in front of her office. Then, on some day, A is introduced to this man by a friend B, who knows the man called John since childhood. As person A sees this man regularly, she instantly recognizes John

as the man she sees every day. Since A recognizes John instantly, it is plausible to assume that she will simply attach his name to the singular mental representation she already has for him. It is also intuitive to assume that A and B have type-identical concept tokens of John, which are involved in their successful communication about him. The problem for Sainsbury and Tye then is that these tokens do not share their origin. A's JOHN tokens originate in A herself on the basis of her own visual experience. The same is not true for B, however, as he knew John prior to, and so independently of, A. That way, the example shows that concept tokens can be type-identical despite having a different origin.

The second type of case problematic for Sainsbury and Tye concerns concept tokens that are type-distinct despite sharing an origin. One example of this is Kripke's well-known Paderewski case, in which Pierre arrives at two concepts for Paderewski that are type-distinct despite sharing their origin in the unique concept of a second party. The same is also true in Fodor's Jackson Pollock case mentioned before. As an example, one can consider a speaker who has one concept for Jackson Pollock, but who speaks about the painter alternating between using the name "Jackson" and "Pollock". This is certainly not strange if the speaker assumes that the audience is familiar with the painter. It is possible, however, that two members of the audience, who have never heard of Jackson Pollock before, form two distinct concepts, one corresponding to "Jackson" and one corresponding to "Pollock". To begin with, the resulting JACKSON and POLLOCK tokens are type-distinct, as they represent different symbols in the respective Language of Thought of the two audience members. Moreover, for the many reasons mentioned repeatedly, it is necessary to adequately type-identify them intersubjectively. For instance, the speaker might mention that Pollock is American. It will then be true to say that both audience members believe that Pollock is American, but not that Jackson is. Unfortunately, Sainsbury and Tye's proposal is not helpful in this regard, as the JACKSON and the POLLOCK tokens have the same origin. All the tokens originate in the speaker's unique representation for Jackson Pollock. Hence, the origin of concept tokens is not an adequate criterion in addition to their reference to determine their intersubjective type-identity.

To be fair, Sainsbury and Tye are mostly concerned with what they call indexical concepts rather than the singular concepts underlying the use of proper names. In line with this, they stress with regard to the Paderewski case that "[i]t's not up to [them] to determine anything about the nature or semantics of that concept." (Sainsbury and Tye 2011: 114, footnote 7). Their proposal is thus arguably not intended as a general proposal about type-identity of all types of concept. This exegetical issue is not relevant here, however, as the crucial question for current purposes is simply whether an originalist approach can be offered on behalf of Fodor to defend a Referentialist semantics for the Language of Thought. The counter-examples show that it cannot. This yields the same conclusion for the origin of a concept as for its conceptual role. Sameness of origin is neither sufficient nor necessary for the type-identity of concept tokens. The concept tokens that share an origin do not coincide with those that are type-identical. It follows that neither the conceptual role nor the origin of a concept token represent a viable criterion to be used in addition to reference to adequately type concepts tokens across subjects. It further follows that both augmented Referentialist proposals fail to provide a satisfactory solution to the intersubjective variant of Frege's Puzzle for the Language of Thought.

While these failures do of course not establish conclusively that all non-semantic proposals to the intersubjective variants of the Puzzle are unsatisfactory, they at least strongly suggest that a criterion other than the content of a concept is unsuitable as it lacks the necessary flexibility to account for the intersubjective type-identity of concepts tokens in the general case. This in turn suggests that Referentialism about the content of the Language of Thought is untenable. At the very least, it is clear that none of the proposals to uphold Referentialism that are currently offered in the literature work. As a result, intersubjective Frege cases remain a residual problem for the Referentialist about the content of the Language of Thought. This also shows that Fodor's claim to the contrary notwithstanding, Fregeanism is based on more than just an intuition about the proper conception of mental content. Instead, contemporary Fregeanism is based on arguments similar to those offered originally by Frege. Frege's Puzzle for belief shows that a purely Referentialist semantics is inadequate as a theory of content for the Language of Thought. So what Frege argued to be the case in general is true in the specific case of a semantic theory for the Language of Thought as well. The next section therefore considers the original semantic theory proposed by Frege as a possible alternative theory of content for the Language of Thought.

5.3 Fregeanism and the Language of Thought

This section considers the application of a Fregean semantics to the Language of Thought and is structured as follows. First, the approach is explained and it is indicated which theorists endorse it. Next, a few counter-arguments against the proposal in the literature are discussed and rejected. After that, two main problems are raised that ultimately call into question a Fregean semantics for the Language of Thought. The first issue pertains to the explanatory usefulness of senses in view of their ontological nature. The second problem concerns cases the Fregean proposal is unable to address due to the fact that its solution is based on an identity relation between senses which is necessarily transitive. The subsection first describes the initial case against Fregeanism provided by Kripke and the version of the problem developed by Fine. In both cases, it is argued that they leave room for the Fregean to respond. In the final part, another variant of the case is therefore presented, which is designed specifically to disallow the response proposed on behalf of the Fregean.

The main idea behind Fregeanism for the Language of Thought is that concepts are associated with two distinct levels of semantic content, reference and sense. This is to say that semantically, referring concepts, which are mental representations and word-like constituents of the Language of Thought, refer to some extra-linguistic object or property and express a sense, which is a semantically significant way of presenting a reference. For co-referential concepts, this entails that a difference in sense minimally represents a difference in how the shared reference is presented as a matter of the semantic content of the concepts.

A Fregean theory of mental content is at least implicitly endorsed by several contemporary philosophers. Peacocke, for instance, maintains that concepts are senses expressed by mental representations (1991: 525). Terminological differences aside, this means that for Peacocke mental symbols have a reference and a sense. Zalta defends a Fregean semantic theory as well, on which mental tokens have senses as their content, even if Zalta neither endorses nor rejects the Language of Thought hypothesis explicitly (2001). As mentioned, Sainsbury also defends a Fregean semantics

(2002)[24]. Like Zalta, Sainsbury does not explicitly endorse nor reject the Language of Thought hypothesis either. Another recent Fregean approach to semantics and the theory of concepts is offered by Glock, even if he defends Fregeanism for very different reasons (2009). Finally, Chalmers has also proposed a Fregean account of propositional attitudes (2011). Since Chalmers has also defended connectionism, it is reasonable to assume that Chalmers would reject the Language of Thought hypothesis, however (1993). This shows that is not at all uncommon in contemporary literature to endorse a Fregean semantic theory. Hence, to the extent that these theorists would accept the Language of Thought hypothesis, it is reasonable to expect that they would provide a solution to Frege's Puzzle for the Language of Thought on the basis of a Fregean sense theory[25].

The basic Fregean response to Frege's Puzzle for the Language of Thought is the idea that sense-identity can be used to account for type-identity. Co-referential concept tokens are type-identical if they express the same sense, and type-distinct if they express different senses. It is interesting to note that Frege himself apparently held a view similar in spirit (Textor 2010c: 18-19). For Frege, two written or spoken expression tokens are of the same expression type if they are similar and more importantly, if they are used with the intention of making it obvious that they determine the same object (Frege 2006b: 107). Moreover, for Frege it is definitional for tokens to have the same sense that their reference is obviously the same. Hence, assuming that expression types are associated with a unique sense, which entails that sense-distinct expression tokens belong to different types, it is very natural to think that for Frege expression tokens count as type-identical because they express the same sense, which in turn is the case if they make it obvious that they have been produced with the intention of determining the same referential object[26]. This Fregean idea can be extended to Language of Thought expression tokens as well, in the sense that concept tokens can express senses and that their type-identity can be based on sense-identity[27]. Evidently, this means that Frege's well-known dictum that "the study of thought is to be sharply distinguished from the study of the psychological process of thinking" has to be given up (Dummett 1978: 458). That, however, is not surprising if semantic theories are considered with a view to explaining human cognitive capacities.

5.3.1 A Fregean Solution to the Puzzle

As mentioned, the basic Fregean solution to Frege's Puzzle for the Language of Thought is rather simple. Language of Thought concept tokens are type-identical if they express the same sense, and type-distinct if they express a different sense. It is important to note that on his proposal, a difference in sense between concept tokens exists in addition to a syntactic difference between

[24] It is not entirely clear whether Sainsbury still endorses Fregeanism after his contribution with Tye (2011). It was explained how the originalist alternative has anti-Fregean tendencies, but it was also explained that the proposal is explicitly limited to indexical expressions. Hence, it is not entirely clear whether the originalist proposal is supposed to replace or merely to amend or complete a Fregean semantics for concepts in general.

[25] This evidently assumes that these theorists accept, first, the Language of Thought hypothesis, secondly, that it has the problem described, and thirdly, that the alternative proposals fail.

[26] That said, it is very common in the literature to maintain that token expressions have semantic properties only in virtue of being tokens of a certain type, which is to say that tokens "inherit" their semantic properties from their types. In that case, token expressions cannot be said to be of a given type because they express the same sense, as they only express the same sense because they are of the same type. In other words, sense-identity cannot account for type-identity, as it presupposes it. Given how common this view is, it is possible that Frege would have endorsed it as well.

[27] Language of Thought expression tokens are not the target of intentions, however.

them, and independently of a difference in origin or conceptual role. Prima facie, a Fregean can thus readily provide the required type-identity criterion in intrasubjective as well as intersubjective Frege cases. The example of two ancient Greeks A and B and their thoughts about Venus can make this clear. The Fregean can maintain that A's HESPERUS concept tokens count as type-identical with B's HESPERUS concept tokens as they express the same sense, while being distinct from B's PHOSPHORUS tokens which express a different sense. The same is evidently true for the other examples used previously, such as BLAIR and ORWELL or SUPERMAN and KENT. In all these cases, a Fregean will appeal to a shared sense to account for the intersubjective type-identity of some tokens, and explain the corresponding type-difference between other tokens on the basis of a difference in sense. Unsurprisingly, Fregeanism thus offers a solution to the version of Frege's Puzzle that arises for the Language of Thought in the form of the type-identity problem for co-referential expression tokens.

Does this mean that Fregeanism offers a definite solution to Frege's Puzzle for the Language of Thought? Unfortunately, this section shows that Fregeanism faces decisive problems. Before considering those, a brief discussion of some issues raised against Fregeanism in the literature that do not in fact undermine the approach, however. The most important criticism in this regard concerns specific proposals as to what senses consist in, such as a description or some other substantial notion of a mode of presentation. Kripke, for instance, argues that a Fregean sense theory cannot solve Frege's Puzzle for belief on the basis of a descriptivist understanding of senses (1979: 244, 246). More specifically, Kripke's argument is based on the idea that sameness of associated description entails sameness of sense, in which case it is possible to raise a Puzzle for proper names that have the same descriptive content associated with them. In the more recent literature, the underlying conception of Fregeanism is more generally based on a substantial conception of modes of presentation. In the same vein as Kripke, Fodor argues that Fregeanism cannot accommodate his Jackson Pollock example (1998: 16). The reason is that both "Jackson" and "Pollock" have the same mode of presentation, namely that of being a painter, and Fodor assumes that the names therefore have the same sense. A richer conception of modes of presentation is also often at the basis of a challenge posed to the Fregean to say what exactly the difference in sense consists in:

> "The main problem with the Fregean position, to my mind, is to say, in particular cases, what the difference in the meaning or sense of the names might plausibly be taken to be. Although there appear to be good theoretical reasons for thinking that there must be a difference, it seems hard to say in particular cases what it is. For as Kripke [...] has pointed out, it seems possible for a speaker, or for speakers, to associate the same beliefs or information with two names, such as "Cicero" and "Tully." And if the information or beliefs are the same, then how can the sense be different?"
> (Fine 2009: 35)

The main problem with these types of argument is that any substantive determination of senses as modes of presentation is not essential to Fregeanism (Sainsbury 2002: 10). In other words, a Fregean has the option to abandon a richer conception of senses while maintaining the two-tier Fregean conception of semantic content, which is precisely what Sainsbury proposes (2002: 5). On the more modest view, a difference in sense will be independent of a difference in associated description, and more generally, of any difference in mode of presentation that needs to be specified independently. Instead, semantic facts about senses are taken to be fundamental facts that are not

necessarily explicable in terms of non-semantic facts. The same is true for many similar challenges to Fregeanism. Heck, for example, points out that Peacocke's possession conditions cannot individuate senses (2011: 16). While one can agree with Heck that some concepts have different senses but the same possession conditions and vice versa, this is by no means a good reason to give up a Fregean sense theory. The more reasonable consequence is to give up the idea that senses and sense-identity have to be explained in a substantial way in terms of something else.

An opponent of this strategy can reasonably ask what the purpose of such a semantic theory is, given that it posits senses as additional entities without having them contribute much by way of explanation. Sainsbury in fact recognizes and concedes the explanatory modesty of his proposal (Sainsbury 2002: 126-127). There are three points to make in defense of this modesty, however. First of all, the explanatory richer proposals are useless if they are incorrect. Consequently, it is better to explain less than to offer false explanations. Moreover, proposals known to be inadequate cannot reasonably be used to set an explanatory standard, especially if it is arguable that they fail precisely because they provide too much by way of explanation. Secondly, the modest proposal admittedly weakens the explanatory power of the theory, but it does not jettison it entirely. The reason is that it can make use of a weaker explanatory principle. The richer proposals are all based on the principle that there is something that in all cases of sense-identity explains this sense-identity. For a descriptive version of Fregeanism, for instance, the identity of the associated description explains all instances of sense-identity. The weaker principle holds instead that in all cases of sense-identity, there is something that explains it. This allows that one instance of sense-identity can be explained by the identity of an associated description, but that another instance of sense-identity can be explained differently. The explanatorily more modest goal is thus have every case of sense-identity explained by something without having something explain every case of sense-identity. Thirdly, by positing senses, the Fregean proposal still provides the theoretical tools that are in principle necessary to address the intersubjective version of Frege's Puzzle for the Language of Thought, unlike pure Referentialism, say. In that sense, Fregeanism is preferable to pure Referentialism even if it is not much more explanatory.

Fodor offers a further criticism against Fregeanism for the Language of Thought that also misses the mark:

> "Whatever distinguishes coextensive concepts is ipso facto 'in the head'. This means, something like that it's available to be a proximal cause (/effect) of mental processes." (Fodor 1998: 15)

Fodor's basic argument is that whatever distinguishes co-referential Language of Thought expression tokens is causally relevant for computational processes and the causation of behavior. He reasons that the difference must be a syntactic difference, and cannot be a difference in Fregean sense, as Fregean senses cannot have causal powers by virtue of the fact that they are abstract objects outside of the causal realm. Fodor concludes that co-referential Language of Thought expressions have to distinguished by the fact that they are syntactically distinct objects rather than by the fact that they express distinct Fregean senses. The mistake, however, is to think that the difference between co-referential mental representations is either exclusively syntactic or semantic. A Fregean about the content of the Language of Thought will reasonably maintain that there is both a syntactic and a semantic difference between co-referential concepts. In other words, for the Fregean every intrasubjective difference in syntactic vehicle correlates with a semantic difference

in content. Accordingly, the Fregean can accept Fodor's point about causation, maintaining that senses are not causally efficacious by themselves, but only via the syntactic vehicles with which they are uniquely correlated. Senses are then not different from content in general in this regard. On a computational and representational approach to the mind, referential objects also causally affect behavior only via the mental representations that refer to them. Similarly, senses affect behavior only via the mental representations that express them. It follows that Fodor's point is problematic only for the Fregean who unreasonably maintains that sense differences are without correlate in the syntax of the Language of Thought. Fodor in fact recognizes this as well (1998: 15, footnote 9, also p. 21). Hence, it was presented here only for the sake of completeness.

Fodor has in fact always pursued a two-pronged strategy against Fregeanism for the Language of Thought, arguing that the approach is neither necessary nor possible. It is not necessary as Referentialism is enough to solve Frege's Puzzle, and not possible because a Fregean semantics is itself subject to major difficulties. It has already been argued in this chapter that Fodor's first line of argumentation fails, as neither pure Referentialism nor an augmented version of it is able to adequately address the intersubjective variant of Frege's Puzzle for the Language of Thought. Fodor's points in favor of his second line of argumentation have not been much more promising so far, as it is possible to develop a sense theory for the Language of Thought that avoids the problems mentioned by Fodor and others. The next section aims to show that Fodor is nonetheless right.

5.3.2 Problems for Fregeanism for the Language of Thought

This section argues that Fregeanism for the Language of Thought fails for two reasons, which both concern the limited explanatory scope of the theory. The first limitation is due to explanatory efficacy of senses in view of their ontological nature. The second limitation is due to the existence of Frege cases that a Fregean sense theory is in principle unable to accommodate. Before considering both problems in detail, however, first a brief discussion on the ontological status of senses.

5.3.2.1 The Ontology of Senses

Frege notoriously posits senses as denizens of a third realm (1918: 69). Many philosophers have since taken exception to the idea of senses that exist as abstract objects in their own special region of reality, if for very different reasons. Fodor, for example, holds that using senses to solve Frege's Puzzle undermines naturalism:

> "One option is to grant the prima facie implications of Frege cases and look for something (call it the expression's sense) that expressions share if and only if substitution of one for the other is valid in [propositional attitude] contexts. The residual (and highly nontrivial) problem would then be to provide a naturalistic account of senses [...] so construed."
> (Fodor 2008: 52)

To this Fodor adds in a footnote:

> "Frege clearly thought that a naturalistic theory of senses is out of the question; [...] and so do I. However, [he] didn't mind a naturalistic theory of senses being out of the

question because [he wasn't a] naturalis[t]. I am, so I do."
(Fodor 1998: 52, footnote 3)

As is well-known, Frege posits a third realm of entities because of his belief that senses do not belong to the realm of the physical by reason of being abstract, nor to the realm of the mental by reason of being what Frege calls objective, by which he means that the very same senses can be grasped by different thinkers (1918: 69). Because senses and thoughts, which are composed of senses, can be shared in this way, Frege believes that they cannot be mental representations, as every person has its own and unique mental representations[28]. As explained, Frege's point is mistaken in that it overlooks the type/token distinction (Margolis and Laurence 2007: 567). While thought tokens are concrete mental representations that are unique to each thinker, thoughts as types can be shared in the sense that different thinkers can have tokens of the same type of thought. So because Frege believes that senses and thoughts are objects that are neither physical nor mental, Frege introduces a third realm of abstract objects. Frege thus endorses a Platonic conception of abstract objects in general, and of thoughts and senses in particular. Many philosophers since Frege have been skeptical about the existence of Frege's third realm of reality, as evidenced by Dummett who considers Frege's third realm a myth (1996). At any rate, most contemporary philosophers of language are arguably more worried about the cognitive access Fregeans assume people have to the objects in the third realm. More precisely, they are concerned with what it means to say that human minds are able to grasp senses as well as the thoughts they combine into:

"[T]he sense-based solution to the mode of presentation problem says that the reference of a word or internal representation is mediated by a sense that we grasp. But what exactly does grasping consist in? Clearly, grasping is a metaphor for a cognitive relation that needs to be explicated. The problem is that it is hard to see how this can be done in a way that is consistent with the view that senses are abstract objects. Notice that the relation can't be causal, since senses, as abstract particulars, are supposed to fall outside the realm of physical causes and effects."
(Margolis and Laurence 2007: 580)

The reason it is sensible to worry more about the epistemological implications of Frege's sense theory rather than its ontological implications is that the issue about the ontological status of senses allows for a simple response. Senses are abstract objects and thus no different from other abstract objects, such as numbers, sets or types. Since most philosophers of language accept the existence of abstract types, positing senses and Fregean thoughts does not lead to additional ontological worries. However, the crucial difference between senses and other abstract objects is the way senses relate to expressions semantically. Expressions refer to abstract objects like numbers and types, but they express senses[29]. Only senses are expressed by linguistic expressions, all the other abstract objects are referred to by them. Hence, semantically speaking, senses are not on a par with other abstract objects. Frege's theory of senses posits a unique semantic relation between expressions and senses as abstract objects, which is without analogue in either the semantic theory or other theories of abstract objects. This is why Laurence and Margolis consider the elucidation of the cognitive relation of grasping senses the more pressing issue for the Fregean, which has to

[28] Frege calls them "Vorstellungen".
[29] Expressions can of course refer to senses as well, but that does not change the relevant fact that all referring expressions necessarily express senses on the Fregean view.

take into account their ontological status as abstract objects.

On a view that applies a Fregean semantics to the Language of Thought, however, the cognitive relation between thinkers and senses is explicable in more fundamental theoretical terms. To be precise, grasping a sense consists in tokening a mental representation that expresses the sense. Hence, to cognitively grasp the sense of a name, a thinker only has to token a Language of Thought symbol that semantically expresses it. Evidently, this entails that in addition to the relation of reference, Fregeans have to countenance a unique semantic relation of expressing that holds between Language of Thought expressions tokens and their abstract senses. This does not change the fact that cognitive relation of grasping senses can be explained in terms of a semantic relation of expressing, however, in much the same way that the cognitive relation of thinking about something, which is at the root of intentionality, can be explained in terms of the semantic relation of reference.

A further question then is whether the semantic relation of expressing can be reduced to a non-semantic relation, in the way that some philosophers, most notably Fodor, think that the semantic relation of reference can (Fodor 2008: 204). Based on the assumed reducibility of reference to a causal relation, Fodor argues against Fregeanism that the referential relation is naturalistically acceptable while the relation of expressing senses is not. As explained before, however, there are in fact good reasons to be skeptical about the reduction of reference, because of which there is little motivation to reject Fregeanism on those grounds. Fodor's criticism is based on an explanatory standard dervied from a very reductionist understanding of naturalism and its implications for semantic theory that a Fregean can reasonably reject given that is not met by reference either, which is something most Referentialists actually concede. In the quote, Laurence and Margolis hint at a similar objection to Fregeanism. They point out that the relation between expressions and senses cannot be based on a causal connection, since senses are abstract objects. The underlying idea is supposedly that reference relies on a causal connection insofar as people can refer to worldly objects because they causally affect their senses. However, by this standard it would be impossible for people to refer to abstract objects. Since it is hardly plausible to assume that people cannot think about numbers and other mathematical objects just because they are abstract, the obvious conclusion is that the criticism is based on a standard that Fregeans can reasonably reject.

The upshot is that the semantic relation between Language of Thought symbols and their senses has to be metaphysically accepted if senses prove to be semantically necessary. Fodor argues that this is not the case as he mistakenly believes that Frege's Puzzle can be solved with a Referentialist semantics for the Language of Thought. In the next chapter, however, the thesis largely corroborates Fodor's view, as it will be argued that a Relationist semantics for the Language of Thought does not rely on senses as mind-external abstract objects that have to be grasped to solve the Puzzle, which undermines the Fregean necessity claim and so constitutes an argument against Fregean sense theories. It shows that senses are semantically dispensable, which renders the relation of expressing redundant as well. It is also clear, however, that a similar question then arises for the alternative notion of content posited by the Relationist, which is semantic coordination. Unlike Referentialism with its unique tier of semantic content, Semantic Relationism evidently has no strategic advantage over Fregeanism in this respect. Accordingly, the issue between Fregeanism and Semantic Relationism is which theory is the more convincing overall, and the main aim in the rest of this chapter and the next is to show that Semantic Relationism is ultimately preferable. However, at this point, it is fair to conclude that the ontological nature of senses as such is not

a decisive argument against Fregean sense theories. A Referentialist might well disagree, but this is not convincing as long as Referentialism fails to adequately address Frege's Puzzle and fails to offer a plausible reduction of reference. The first real problem for Fregeanism, however, is that the ontological nature of senses leads to a closely related epistemological worry that undermines the explanatory power of senses, which is the topic of the next subsection[30].

5.3.2.2 The Ontology of Senses

The main concern in the previous subsection was to explain how thinkers can have cognitive access to senses as abstract objects. The more pressing worry for the Fregean raised here is to say why it is reasonable to assume that the cognitive access to senses is privileged, in a sense to be specified momentarily, given their metaphysical status as abstract and mind-external objects. Although both issues are often run together in the literature as a question about the cognitive access to senses, it is important to separate the two distinct if closely related concerns.

To begin with, it is important to explain in what sense the cognitive access to senses is supposed to be privileged. In the current context, it initially means that it as to be assumed that a cognitive system cannot be mistaken about the sense expressed by its Language of Thought symbol tokens. In light of Sainsbury's argument that the relation of sense-identity is the semantic notion of primary importance, the point can be reformulated as follows (Sainsbury 2002: 126). Fregeans have to assume infallible knowledge about sense-identity, which means that they have to assume that a cognitive system cannot possibly be mistaken about the sense-identity between two of its Language of Thought symbol tokens. The relevant necessity is evidently not metaphysical, as if there could be no possible world in which a cognitive system is mistaken about whether two of its symbols have the same sense or not. The necessity is rather normative. If a cognitive system is mistaken about the sense relation that holds between two of its symbol tokens, the system has to be taken to violate a semantic norm, the norm of rationality, say.

Why is the assumption of privileged access necessary? The reason is that the theory otherwise leads to an infinite regress:

> "If Frege's [Puzzle] is not to arise again for senses, they need to be objects concerning which we have infallible recognitional powers [...]"
> (Sainsbury 2002: 3)

A Fregean postulates senses because they capture the different ways in which people can refer to the same object they fail to recognize as the same. For instance, the Ancient Greeks refer to Venus as "Phosphorus" in the morning, and "Hesperus" in the evening as they fail to recognize that it is the very same object in both cases. Senses can only play this role, however, if people cannot

[30] A final remark on a suggestion made by Fine to understand "senses as the result of a Fregean abstraction on the equivalence relation 'is of the same mental representation type' " (personal conversation). On the proposed view, the relation of a mental representation token expressing a sense reduces to its being a token of a given type, and grasping a sense is nothing more than to token a mental representation of the correct type. Whatever the merits of this proposal, the main problem in the current context is that a sense theory can then no longer be used to solve the type-identity problem for mental representation tokens, as it presupposes a solution to it. In other words, senses cannot be used to explain the type-identity of tokens if senses are themselves defined in terms of type-identity. Moreover, once something else is available to account for the type-identity of mental representation tokens (such as coordination), there is arguably very little left for senses to do. This proposal made by Fine on behalf of the Fregean does thus not look very promising in view of the problem at hand.

be mistaken about them in the way that they can be mistaken about the reference of expressions. Otherwise the truth of the thought that Phosphorus is Phosphorus would not be any more obvious than the truth of the thought that Phosphorus is Hesperus, as people could be as unsure about the identity of sense in the first case as they can be about the identity of reference in the second. Hence, if knowledge about sense-identity is not infallible, the Fregean would have to posit another level of sense to mediate the semantic relation between expressions and their senses. Since the same argument then applies to these additional senses, the result is an infinite regress.

Fodor agrees with Fregeans that the access to senses has to be privileged, but he points out that the assumption has to be justified:

> "The question thus arises what, if anything, is supposed to legitimize this assumption. As far as I can tell, unless you're prepared to give up [the thesis that senses are abstract and hence non-mental], the only answer a Fregean theory allows you is: sheer stipulation."
> (Fodor 1998: 17)[31]

Fodor's basic point is that the assumption that access is privileged has to be reasonable given the nature of the objects to which the privileged access is assumed. Fodor specifies the idea as follows:

> "Frege needs something that can both present referents to thought and individuate thoughts; in effect, he needs a kind of [mode of presentation] that is guaranteed to have only one handle. He can't, however, get one just by wanting it; he needs to explain how there could be such things."
> (Fodor 1998: 19)

Fodor's challenge for the Fregean is to explain why it is reasonable to assume that the access to senses is privileged in view of the assumption that senses are abstract and mind-external objects. The contrast Fodor makes at this point is with the syntactic properties of Language of Thought symbols, which are mental properties, and thus directly accessible to the mind. For that reason, it is reasonable to assume there is privileged access to syntactic properties, but Fodor asks what justifies the assumption that the same is true for Fregean senses as well[32].

Fodor's point can be clarified by means of the normative impact of misidentification in terms of rationality. Clearly, it is rational to believe that Hesperus is not Phosphorus, but it is not rational to believe that Hesperus is not Hesperus. So if a person knows the reference of two expressions, a failure to recognize that they are the same does not necessarily entail a failure of rationality, which is why it is not irrational to believe that Hesperus is not Phosphorus[33]. The same is not true for senses, however. If a person knows the senses of two expressions, a failure to recognize that they are the same ipso facto entails a failure of rationality, which is why it is irrational to reject the identity of Hesperus with itself[34]. The question then is why sense-identity differs from co-reference in this regard. The Fregean explanation has to be that access to senses is privileged, in contrast to reference, which is why the misidentification of reference but not sense is compatible with rationality.

[31] See also (Fodor 1998: 16).
[32] See (Margolis and Laurence 2007: 581) for this point.
[33] If one already believes that Hesperus is Phosphorus then it is of course irrational to believe that Hesperus is not Phosphorus at the same time, but the reason is not that one rejects the identity, but that one endorses both a thought and its negation, as shown by the fact that one can reinstate rationality by giving up either the identity or its negation.
[34] Identity statements with empty terms are set aside here.

Fodor's objection then is what justifies this assumption for senses in contrast to reference. More specifically, Fodor argues that it is reasonable to assume privileged access to the syntactic properties of Language of Thought symbols as they are part of the mind, in stark contrast their reference, which are generally mind-external objects that are prone to misidentification for that very reason. From this perspective, Fodor's rhetorical question is what legitimizes the assumption that senses are more like syntactic properties rather than reference. His argument against Fregeanism is that nothing actually legitimizes this assumption, that it is based on "brute stipulation" instead (Fodor 1998: 19). As the assumption is crucial to avoid the infinite regress that threatens to undermine the explanatory usefulness of senses, Fodor's objection is that the Fregean lacks the legitimacy to claim that a theory of sense can be used to solve Frege's Puzzle for the Language of Thought.

There is in fact a closely related worry that is nonetheless importantly different. On certain interpretations of Frege's classical approach, senses are the objects that primarily refer rather than the symbols that express them[35]. On this view, senses are the fundamental bearers of referential properties, while expressions refer only in a derivative sense, namely by expressing senses that do. This means that senses are themselves taken to be vehicles of representation. If that is the case, however, it raises a question as to why senses cannot present the same reference in different ways, as is the case for other vehicles of content, such as linguistic expressions or Language of Thought symbols. Since there is no good reason to assume that this not possible, it follows that the theory has to appeal to an additional sense to mediate between the primary sense and its reference. As the same holds true for the additional sense as well, the result is an infinite regress. The outcome is thus the same as in Fodor's argument above. In order to uphold the classical Fregean view, it has to be assumed that there can be only one way in which a sense presents a reference, to which people have to have infallible epistemic access. The reason this concern is still different is that allows for a simple response. The Fregean can simply give up this understanding of Fregeanism by maintaining that expressions are the primary bearers of referential properties and not their senses, and that senses determine not the referential object of the expression, but only the referential relation between the expression and the object. This arguably avoids the regress argument just described. Unfortunately, Fodor's argument cannot be rejected in this way.

At any rate, Fodor's underlying reasoning is quite simple. Fodor first asks why people can be rationally mistaken about the identity of reference. The obvious answer is that people refer mostly to mind-external entities that are therefore not directly cognitively accessible, which explains why they lack infallible knowledge about them. More specifically, the cognitive access to mind-external objects is always mediated by mental representations, which alone are directly cognitively accessible. Since according to Fregeans senses are likewise mind-external objects, access to which is also mediated by mental representations, what legitimizes the assumption that the cognitive access to senses is not fallible in the same way? Fodor emphasizes that the Fregean sense theorist cannot simply stipulate infallible access to senses. The assumption needs proper justification given that it is pivotal for the entire explanatory power of the theory.

Unlike in the case of referring senses, a Fregean cannot reject Fodor's privileged access argument by pointing out that the semantic relation of reference is different from the semantic relation between an

[35] The reason is Frege's claim that "when we call a sentence true we really mean that its sense is true" (Frege 1918: 60). Since truth consists in the reference to the value True, and thoughts are the senses of sentences, it follows that senses primarily refer.

expression and its sense. This counter-argument is reasonable for the argument involving referring senses insofar as the existence of different ways to refer to an object does not justify the assumption that there are different ways to express a sense, precisely because they are fundamentally different semantic relations. Fodor's argument, however, is not about the semantic relation that holds between expressions and objects, be it senses or references, but about the mind-external nature of the object that is the relatum of the semantic relation. The fact that the semantic relation between an expression and a sense is different from the relation between that expression and its reference is irrelevant for that argument. The question thus remains why it is legitimate for the Fregean to assume that thinkers have infallible access to senses. And Fodor seems to be right that Fregeanism offers no adequate answer to this question, which seriously calls into question the viability of a Fregean sense theory to solve Frege's Puzzle for the Language of Thought.

As mentioned, Fodor uses this argument to promote his syntactic solution to the Puzzle, based on the fact that the syntactic properties of mental representations are mind-internal and so directly accessible to the mind. Unfortunately for Fodor, the intersubjective variant of the Puzzle shows that an appeal to syntax is not enough to solve Frege's Puzzle for the Language of Thought. Accordingly, there are two lessons to draw. First, whatever distinguishes co-referential concepts should be mental, and secondly, it should be semantic. This means that a proper response to the Puzzle requires a semantic difference between co-referential concepts that is internal to the mind, at least in the relevant cases. The aim in the next chapter is to argue that only Semantic Relationism can accommodate both requirements. While sense-identity is always an extra-mental relation between abstract objects, some token coordination relations are mental relations between mental particulars instead. As such, these relations are both semantic and directly accessible to the mind. Importantly, the claim is that sense-identity is always a mind-external relation, while some (but not all) coordination relations are not. More precisely, intersubjective coordination relations, which hold between the mental symbols of different thinkers, are always mind-external relations as well. As a result, there is no privileged access to intersubjective coordination relations. Fortunately, however, privileged access is not required for intersubjective coordination relations, as they play no role in the explanation of cognitive facts that require privileged access. Instead, they play a role in the explanation of non-cognitive facts, such as the sharing of thoughts on which both the theory of linguistic communication and the availability of psychological laws are predicated.

Admittedly, the difference between Fregeanism and Semantic Relationism is even more subtle than suggested so far. The reason is that the current thesis ultimately endorses the claim that intrasubjective coordination between mental symbols is grounded in their syntactic identity, which is to say that a cognitive system keeps track of semantic coordination by the use of identical mental symbols. In other words, the mind realizes and recognizes coordination in content by virtue of the repeated use of mental symbols. In Fregean terminology, this is to say that a thinker grasps a semantic coordination relation, which is part of the content of its thoughts, by means of the use of identical symbol tokens. In connection with privileged access, this means that intrasubjective coordination is a mental relation accessible to a cognitive system via the syntactic properties of its mental symbols. In this regard, Fodor is right in his claim that the privileged access is ultimately based on the directly access to the syntactic properties of mental representations. His mistake is his assumption that there is no semantic correlate to the syntactic identity relation.

This raises an important question as to why the Fregean cannot use the same idea, however.

Why can the Fregean not claim that sense-identity is based on the syntactic identity of mental symbols, and then claim that a cognitive system has privileged access to the sense-identity relation by virtue of its privileged access to the syntactic properties of its mental symbols? While it has to be conceded here that this is a possible option for the proponent of a Fregean semantics for the Language of Thought, it is argued in the next chapter that Semantic Relationism nonetheless has a crucial advantage in this respect. The reason is that a Relationist semantics can explain systematic facts about how semantic content depends on syntactic properties that remain inexplicable on the Fregean approach. Roughly, the crucial point is that it is only possible to ground either coordination or sense-identity on the syntactic identity of symbols in the intrasubjective case. This is not possible in the intersubjective case, as sameness of sense or coordination does not depend on the identity of the underlying mental symbol, given that content is multiply realizable. Hence, there is a systematic difference between the intrasubjective and the intersubjective case in this respect. The problem for Fregeanism is that it cannot explain why there should be this systematic difference, as sense-identity is the same mind-external relation in both cases. From the point of view of a Fregean semantics, both cases are equivalent. The same is not true for Semantic Relationism, as coordination does not hold between mind-external abstract objects, in contrast to sense-identity. As a result, coordination is a mental relation between two mental particulars in the intrasubjective case, but a non-mental relation between two mental particulars in the intersubjective case. The intersubjective relation is a non-mental relation by reason of the fact that the mental particulars do not belong to the same mind. That way, the theory can explain why there is a systematic difference in terms of the how the semantic content of the second tier depends on the syntactic properties of the content bearers. Coordination is grounded in syntactic symbol identity only in case it is a mental relation. The crucial difference is thus that while Fregeanism is evidently compatible with the existence of a systematic difference between both cases, it does nothing to explain it, in contrast to Semantic Relationism.

Before presenting a Relationist semantics for the Language of Thought, a final and less subtle argument against Fregeanism. The argument targets the explanatory scope of a Fregean sense theory independent of ontological or epistemological concerns. Based on previous examples from Kripke and Fine, the aim in the next section is to offer a variant of the Puzzle that a sense-theory cannot adequately address. The key aspect is thereby not the universal status of sense-identity as an extra-mental relation, but the fact that it is an identity relation.

5.3.3 Kripke's Variant of Frege's Puzzle

In the literature, Kripke's cases are often discussed as Kripke's Puzzle, but it is arguably more appropriate to consider them Kripke's variants of Frege's Puzzle, as the main concern is still the semantics of co-referential terms first highlighted by Frege. Unimportant terminological issues aside, Kripke's variants stand out as the decisive obstacle for a Fregean sense theory in response to Frege's Puzzle for the Language of Thought. The aim in this section is to develop, on the basis of preceding examples in the literature, a case for which Fregeanism fails. Accordingly, the section begins with a discussion of the examples offered by Kripke and Fine, arguing that they both leave room for the Fregean to respond. Subsequently, a new case is presented, devised specifically to eliminate the possibility for the Fregean to respond.

This section discusses only one example from Kripke's seminal paper on the Puzzle about Belief, and only a modified version of it (Kripke 1979). This is motivated by the aim to sidestep issues that, while important, are peripheral to the Puzzle, for instance issues about the correct theory of translation or the adequacy conditions for belief ascriptions. The aim is to bring out the core problem of Kripke's variant of the Puzzle, based on cases for which, in Fine's terminology, the notion of "same-saying" fails to be transitive (2009: 119). It is interesting to note that before Fine, it has hardly been noticed in the literature that transitivity failures represent the core issue in Kripke's variants of Frege's Puzzle. Using transitivity consideration against Fregeanism has two major advantages, however. First of all, the problem for Fregeanism raised by Kripke is independent of the issues discussed earlier, which means that it represents independent evidence against Fregeanism and in favor of Semantic Relationism. Secondly, the issue does not depend on the specific choices that can be made within the broader Fregean framework, for instance about the role of descriptions or modes of presentations. Instead, it targets a essential aspect of the Fregean approach, and that way it serves to undermine Fregeanism in general, including the most minimal version developed by Sainsbury (2002).

5.3.3.1 Kripke's Original Variant of Frege's Puzzle

Kripke's paper on the Puzzle about belief is best known for its example of Pierre and his contradictory beliefs about London, which is a city Pierre also knows under the French name "Londres" (1979: 254). While much discussed in the literature, the case has a major drawback, however, in that it raises questions about the proper theoretical approach to translation, which are important yet extraneous to the core problem raised by Kripke (1979: 265). For that reason, Kripke's well-known Paderewski example is discussed here instead (1979: 265). It has the advantage that it involves only one language and only one proper name, as Kripke himself points out (1979: 266). The case involves a person called Pierre who first hears about a Polish musician called Paderewski, about whom Pierre forms the belief that he is musical. On a later occasion, Pierre hears about a statesman called Paderewski. Since Pierre is skeptical about the musical talent of politicians, Pierre infers that it must be a different Paderewski, about whom Pierre forms the belief that he is not musical. Pierre is of course mistaken, as Paderewski the musician is the same person as Paderewski the politician. Kripke then wonders whether it is correct to ascribe to Pierre the belief that Paderewski is musical (1979: 265).

For current purposes, the crucial point is that one can assume that Pierre forms his beliefs about Paderewski on both occasions by testimony from one and the same person. In other words, Peter first learns from some person A about Paderewski as a musician, and he then learns from that very same person about Paderewski the statesmen. The core assumption of the problem then is that Peter fails to recognize Paderewski as the same person on both occasions, unlike person A, who knows that the politician is identical to the musician. In the non-committal terminology widely used in the literature, the outcome is that Pierre has two distinct uses of the name Paderewski, while the general public, which includes person A, has only one use of the name. In a Language of Thought based framework, this translates into the claim that Peter has two distinct Language of Thought symbols or concepts for Paderewski, while person A has only one concept for Paderewski in his Language of Thought, from which both Peter's concepts are derived through linguistic interaction. The reason is that on the Language of Thought hypothesis, different uses of a name are realized

through the interpretation by means of different symbols in the Language of Thought. In other words, Pierre has two uses of the name Paderewski since he has has two syntactically distinct symbols for Paderewski in his mind, in much the same way that many people have distinct symbols for, say, the philosopher Aristotle and the shipping magnate Aristotle.

The reason this case is problematic for the Fregean is Kripke's suggestion that on both occasions it is plausible to assume that Peter understood perfectly what person A communicated to him. Kripke's case is such that Peter cannot plausibly be taken to have misunderstood what person A told him on either occasion. For instance, one can imagine that Paderewski is present on both occasions, first giving a concert, later speaking on a political rally, and on both occasions Peter is fully aware that A is speaking about the person on stage. As explained, in the framework of the Language of Thought with a Fregean semantics, this means that on both occasions, Peter derives a thought from person A that has the same sense as person A's thought. On the first occasion, person A has a thought to the effect that Paderewski is musical, and Peter forms the very same thought on the basis of his linguistic interaction with person A. The motivation for this claim is the view that successful linguistic communication is based on the sharing of identical thoughts through linguistic means, which are individuated by the senses they express. The same is true on the second occasion, where Peter derives from A a further thought about Paderewski, for instance that Paderewski is a good orator, and then forms the additional thought that Paderewski is not musical using the same concept for Paderewski.

The major problem for the Fregean then is that this means that each of Peter's distinct Paderewski concepts has the same sense as person A's unique Paderewski concept. Since sense-identity is necessarily a transitive relation, this entails that both Peter's Paderewski concepts have the same sense as well. Given the explanatory role of senses, however, this outcome is unacceptable. For instance, it incorrectly implies that Peter is irrational, because he believes about the same person that he both is and is not musical. In addition, there is longer a difference for Peter between learning that Paderewski the musician is self-identical and learning that Paderewski the musician is identical to Paderewski the politician, as there is no longer a difference on the level of senses between the obvious identity statement and its informative counterpart. As a result, Fregeanism falls short in much the same way that Referentialism does for Frege cases in general.

It is clear that the Fregean has to reject the claim that Peter's distinct concepts for Paderewski have the same sense. To do so, the Fregean has to accept that at least one of Peter's Paderewski concepts does not have the same sense as A's unique Paderewski concept, which in turn implies that the Fregean has to concede that at least one instance of linguistic communication was not successful, by reason of the fact that on that occasion, Peter formed a thought with a concept for Paderewski different in sense from the concept of person A. The challenge for the Fregean is to say which linguistic interaction failed, and to motivate the claim in view of the fact that on both occasions Peter understood perfectly who A was talking about.

To begin with, it is clear that it is the transitivity of the sameness of sense relation that leads to the problem for the Fregean. The sense-identity between each of Peter's distinct Paderewski concepts with a third concept entails that both Peter's concepts are sense-identical as well. Kripke concludes that this casts serious doubt on the Fregean strategy to solve the Puzzle by means of an identity relation between senses. As presented by Kripke, however, the case arguably leaves room for the Fregean to respond. It is evident that the Fregean will reject the sense-identity between Peter's two

Paderewski concepts. To motivate the rejection, the Fregean has to answer two questions. First of all, it has to be determined which instance of communication is not successful, and secondly, it has to be said why. To do so, the Fregean can point to a fundamental asymmetry between the first and second instance of communication. In the first instance, it is hard to deny that the linguistic interaction is successful, as person A speaks about the person on stage being musical, which is exactly what Peter understands. In the second instance, however, there is a sense in which person A is talking about the person on stage as the person talked about before, which is no longer what Peter understands. Instead, Peter takes A to speak about a different person. The Fregean can thus characterize the second instance of communication as unsuccessful and motivate the choice by appealing to a broader notion of linguistic understanding on which Peter fails to properly understand person A in view of what A said before. This will restore transitivity in the sense that it is no longer a problem that sameness of sense is a transitive relation. Since there is no sense-identity between Peter's second Paderewski concept and person A's Paderewski concept, it will no longer follow that there is sense-identity between Peter's distinct Paderewski concepts either, which solves the problem for the Fregean. In addition to this, the Fregean can sensibly point out that Kripke does not present an alternative solution to this Puzzle, which suggests that despite potential drawbacks, the Fregean response remains the best option available.

Kripke and others are aware of this Fregean option to respond, but they reject it. According to Taschek, is not viable (where "us" represents person A in the description above):

> "Once it is proposed that 'Paderewski' in Peter's idiolect is ambiguous, the question must immediately arise what the semantic relation is between 'Paderewski' as Peter uses it, and 'Paderewski' as we (who are not subject to Peter's mistake) use it. Are we to say that neither of Peter's two uses of 'Paderewski' can be (homophonically) translated by 'Paderewski' as we use it, or, rather, that one of his two uses can, but not the other? And if the latter is the case, what considerations decide which of his two uses is correctly translatable by our own and which is not?"
> (Taschek 1995a: 291)

Kripke makes the same point:

> "The problem then would be whether Peter's dialect can be translated homophonically into our own. Before he hears of 'Paderewski-the-statesman', it would appear that the answer is affirmative for his (then umabiguous) use of 'Paderewski', since he did not differ from anyone who happens to have heard of Paderewski's musical achievements but not of his statesmanship. Similar for his later use of 'Paderewski', if we ignore his earlier use."
> (Kripke 1979: 279, footnote 37)

The first point to note is that Taschek and Kripke only consider the outcome of the Puzzle, and completely disregard the way that leads to it. In other words, they focus exclusively on the fact that Peter has two distinct Paderewski concepts, while ignoring the way he arrives at having them. Kripke and Taschek's basic idea then is to present the Fregean with a dilemma. On the one hand, a Fregean cannot assume that only one of Peter's concepts is sense-identical to the unique concept of person A, as it raises a problem to say which one it is and why. On the other hand, the Fregean cannot maintain that neither shares a sense with the unique concept of the general public either,

as there are in fact good reasons to assume that both do.

The crucial problem with this argument is its exclusive focus on the outcome of the Puzzle, as evidenced by the final phrase in Kripke's quote. While it is perhaps true that there are good reasons to assume sense-identity between Peter's second Paderewski concept and the unique concept of person A if the existence of the first concept is ignored, a Fregean will reasonably ask why it should be ignored. More specifically, the Fregean will question the idea that the existence of Peter's first Paderewski concept has to be ignored when ascertaining the success of the linguistic interaction that leads to his second Paderewski concept. In fact, the Fregean can agree that the second concept would have been sense-identical to person A's unique concept, and hence communication would have been successful as well, had the first linguistic interaction not occurred. The Fregean can even point to this fact to account for the symmetry between the two uses that Kripke and Taschek appeal to. Even so, the first linguistic interaction did occur as a matter of fact, which means that there is an asymmetry between the two instances of communication after all. The Fregean can thus motivate the semantic asymmetry between the first and the second linguistic interaction based on a temporal asymmetry, and so justify the claim that Peter's second Paderewski concept is sense-distinct from person A's Paderewski concept[36]. That way, the Fregean is able to say which instance of communication failed and why. This allows the Fregean to deny that both Peter's uses are sense-identical while upholding the transitivity of the sense-identity relation as unproblematic.

This suggests the following interim conclusion. Kripke has not yet shown that there are actually transitivity failures that undermine Fregeanism. Even so, it is already evident how a transitivity failure would be problematic for a Fregean sense theory. Moreover, it has been pointed out that a Fregean can reasonably defend the theory of senses by emphasizing that Kripke raises a potential problem without offering an alternative solution for it, which the Fregean can take to show that Fregeanism remains the best semantic theory available no matter how problematic. In this latter respect, Fine has more to offer than Kripke, as the next subsection shows.

5.3.3.2 Fine's Variant of Frege's Puzzle

Starting from Kripke's general idea, Fine offers the following example:

> "Consider [a] case in which we derive our use P_2 of "Paderewski" from Peter's use P_1 and Peter then derives another use P_3 of the name from our use P_2. If Peter says "P_1 is musical," then we may reproduce what Peter says by saying "P_2 is musical," and Peter, in his turn, may reproduce what we say by saying "P_3 is musical." But Peter does not thereby reproduce what he originally said."
> (Fine 2009: 119)

Reformulating the example in current terminology, the basic idea is that in a first instance, Peter shares the thought that Paderewski is musical with some person A ("we" in Fine's example). Person A then in turn shares this thought again with Peter, who forms a second thought, distinct from his initial one, to the effect that Paderewski is musical. This means that Peter has two syntactically distinct thoughts with the content that Paderewski is musical, each one of which is connected to the unique thought of person A through an instance of linguistic communication that

[36] Importantly, there will always be such a temporal asymmetry in case Peter has two distinct concepts or name uses.

is assumed to be successful. The case clearly raises the same fundamental problem for the Fregean as Kripke's example. It is also clear that the problem arises for thoughts only because it arises for singular concepts, the proper name-like referential constituents of thoughts. Given the transitivity of sense-identity, a Fregean cannot simultaneously endorse the following three claims:

(1) Peter's P_1 concept has the same sense as person A's P_2 concept.

(2) Peter's P_3 concept has the same sense as person A's P_2 concept.

(3) Peter's P_1 concept does not have the same sense as Peter's P_3 concept.

Arguing that all three concepts are substantially connected semantically, Fine offers the following analysis:

> "To account for this phenomenon, we need a notion of "same-saying" or of "reproducing content" that can fail to be transitive. This is something that the relationist can provide [...]. But it is a mystery what the Fregean might put in its place. If coordination is a matter of having a common sense or "guise" then it must be transitive [...]."
> (Fine 2009: 119)

Unlike Kripke, Fine thus offers an alternative semantic solution, which is the topic of next chapter. The basic idea, however, is that the semantic relation of coordination, which replaces sameness of sense in the Relationist framework, can fail to be transitive. The underlying principle of coordination is that it captures semantically required co-reference, as opposed to mere factual co-reference (Fine 2009: 108). In this way, two tokens of "Hesperus" are semantically required to co-refer, while a token of "Hesperus" and token of "Phosphorus" merely co-refer as a matter of non-semantic fact, which is thus incidental from a semantic point of view. Crucially, factual and semantically required co-reference differ fundamentally in terms of transitivity. If an expression E_1 is co-referential with E_2, and E_2 is co-referential with E_3, then E_1 is co-referential with E_3 as well. Co-reference is a transitive relation, which is not surprising as it is an identity relation. The same is therefore true for sense-identity as well. If E_1 expresses the same sense as E_2, and E_2 expresses the same sense as E_3, then E_1 has to express the same sense as E_3 too. The same is not true for semantically required co-reference, however. If E_1 is semantically required to co-refer with E_2, and E_2 is semantically required to co-refer with E_3, it does not follow that there will be a semantic requirement on E_1 and E_3 to be co-referential as well, even if they cannot be but co-referential. Fine's semantically required co-reference is in this respect analogous to the Fregean idea that sense-identity holds between two expressions if it is obvious that they co-refer. Even if E_1 and E_2 are obviously co-referential, and E_2 are E_3 are obviously co-referential, it does not necessarily follow that it is also obvious that E_1 and E_3 are co-referential as well. For example, the relation of co-reference between E_1 and E_2 may be obvious to one person, and the one between E_2 and E_3 to another, while the co-reference between E_2 and E_3 is obvious to neither of them. This shows that obvious co-reference, which is the underlying Fregean characterization of sense-identity, is not necessarily transitive, while the semantically relevant relation of sense-identity is. In contrast, the semantically relevant notion for the Relationist, semantic coordination, is not necessarily transitive either. This allows the Relationist to endorse the following three claims at the same time:

(4) Peter's P_1 concept is coordinated with A's P_2 concept.

(5) Peter's P_3 concept is coordinated with A's P_2 concept.

(6) Peter's P_1 concept is not coordinated with Peter's P_3 concept.

While Fine offers a solution the problem raised by transitivity failures, in contrast to Kripke, his example leaves the Fregean with the same option to respond as in Kripke's case. The Fregean can appeal to a broader notion of linguistic understanding on which Peter can only count as having properly understood someone if he understands that person correctly given what was said before. There is an intuitive plausibility to this response, as shown by the following fictive conversation:

(7) B: Here is Tom.

(8) C: Tom is great.

(9) B: Who/Which one?

Assuming that both know more than one Tom, it may generally be acceptable for B to wonder which Tom C is speaking about, but that is no longer the case if B has already made one Tom salient. This accounts for why it is intuitive to ascribe a linguistic error to person B in this fictive linguistic interaction. Applying this insight to Fine's example, the Fregean will argue that transitivity is not a concern as one can reasonably argue that Peter misunderstood what person A said to him. Even though Peter already made one Paderewski salient, he understood A as talking about some other Paderewski without having any good linguistic reason for doing so. Accordingly, the Fregean need not ascribe the same sense to P_3 and P_2, and so there is no theoretical pressure to admit that P_1 and P_3 have the same sense either. Put differently, the Fregean can uphold transitivity and so defend the theory of senses by rejecting claim (2).

The second interim conclusion is therefore that Fine does not offer a real case of transitivity failure for the Fregean to worry about either. Unlike Kripke, however, Fine offers a possible solution for it if such a case can be found, which already entails that a Fregean can no longer defend Fregeanism by arguing that it represents the only semantic option available. The next section proposes a case of real transitivity failure that undermines Fregeanism.

5.3.3.3 A Decisive Variant of Frege's Puzzle

The aim in this section is to present a case for which the response given on behalf of the Fregean before is untenable. The scenario involves three protagonists, namely a teacher T, a credulous student B (for believer) who believes everything he is told, and student D (for disbeliever) who is the exact opposite of B, namely paranoid to the extent that she always believes the opposite of what she is told. The scenario has two stages. First, teacher T points out a person called Paul to his students B and D, telling them that Paul is musical, which leads B to form the corresponding belief and D to form a diametrically opposed belief to the effect that Paul is not musical[37]. On a second and independent occasion, D communicates her belief about Paul to B, who again trustfully forms the belief that Paul is not musical. The crucial aspect of the case is that in contrast to T and D, B does not realize that Paul is the same on both occasions. It can be assumed, however, that

[37] The name was changed from "Paderewski" to "Paul" for reasons that will become clear momentarily.

Paul is actually physically present during all linguistic interactions, and that all the interlocutors know that the additional person present is the person called Paul talked about on that occasion. For instance, on can imagine that the protagonists meet on a reception of a musical event, and that Paul wears a name tag and is salient by carrying a huge instrument. While the first interaction takes place in one room, the second interaction takes place later in a different room. This explains why it is possible for B to fail to realize that the Paul talked about is the same on both occasions. As a result, the protagonists will have the following beliefs:

(10) Teacher: Paul is musical.

(11) Disbeliever: Paul is not musical.

(12) Believer: Paul is musical.

(13) Believer: Paul is not musical.

Two claims are necessary to undermine the Fregean proposal. First, the claim that B is not irrational, which entails that both B's concepts for Paul are sense-distinct. Secondly, the claim that none of the linguistic interactions can be characterized as a failure, which breaks down into the following sub-claims:

(14) T's Paul concept has the same sense as B's first Paul concept.

(15) T's Paul concept has the same sense as D's Paul concept.

(16) D's Paul concept has the same sense as B's second Paul concept.

As before, the problem is that these claims are jointly inconsistent, which means that the Fregean either has to accept that B is irrational, which is clearly not an appealing option, or has to characterize (at least) one linguistic interaction as unsuccessful, which means that either (14), (15) or (16) has to be rejected. For the same reasons as in the previous examples, (14) and (15) are hard to reject, however. The first linguistic interaction between the teacher and the students is semantically flawless, as both students understand perfectly what the teacher intends to communicate to them about the Paul saliently present. The problem for the Fregean then is that (16) is just as hard to deny. On the second occasion, believer B again understands perfectly what D intends to communicate to him about the Paul that is saliently present. There is no sense in which B can reasonably be taken to misunderstand what D communicates to him. It is true of course that on the second occasion B fails to recognize Paul as the same person from before, but that is hardly a linguistic error. It is rather a failure to recognize an object, so that B's "mistake" in this regard is the same kind of mistake an Ancient Greek makes when failing to realize that Hesperus is Phosphorus[38]. That "mistake" cannot be used by the Fregean to motivate the claim that (16) has to be rejected, however. This entails that a Fregean has to accept a set of claims which are all individually plausible and yet jointly inconsistent on a Fregean sense theory.

[38] This is why it is not promising for the Fregean to insist that B is irrational. A Fregean sense theory is devised precisely to allow for the distinction between a rational belief that Phosphorus is not Hesperus and an irrational belief that Phosphorus is not self-identical.

In the case described, there is no longer a plausible way for the Fregean to restore transitivity. The main reason is that the sense theorist can no longer appeal to a broader notion of understanding, as it would demand too much. It would require B not only to correctly assess what he was told before by D, but also require him take into account how his interlocutor interacts linguistically with others in situations that may well be beyond his epistemic reach[39]. A notion of understanding that includes this much as a condition for success would be too demanding to serve a useful linguistic purpose. As a result, the strategy proposed on behalf of the Fregean before is no longer a plausible option to restore transitivity and defend a sense theory. In addition, is not plausible to claim that there are good linguistic reasons for B to assume that the same person is talked about on both occasions either. If B fails to recognize Paul as the same person on both occasions, the mere fact that the same name is involved does not constitute sufficient linguistic evidence for B to conclude that the same person is being talked about, given how many people share a common name like "Paul". If anything, epistemic caution dictates that B should not conclude without additional reasons that a person pointed out twice to him is the same just because he or she has the same name. In conclusion, the Fregean needs to point to a failure in either rationality or communication to defend the theory of senses, but neither option is plausible in the case described.

There are two further Fregean responses to this difficulty that have to be considered. First, a Fregean might argue that the right response is to retain the theory of senses but to weaken the relation necessary for successful communication. More specifically, a Fregean could argue that identity of thought and thus sense is not required for successful linguistic interaction, but that only similarity of sense is. This is a possible option because sense similarity is not necessarily a transitive relation, in contrast to sense identity.

There are two difficulties for this idea, though. An initial worry raised by Fodor is that content similarity needs to be explained as well, which is possible only by appealing to an identity relation at some point. According to Fodor, this makes the proposal question-begging. Hence, the similarity based approach:

> "needs notions like same implication, same application, and same meaning in order to explicate [the] notion of content similarity."
> (Fodor 1998: 31)

In view of the problem of transitivity at issue here, the concern is the following. A Fregean could maintain that senses consist of set of descriptions, and that senses are similar if some but not all of the descriptions are shared. The problem is that this requires a prior notion of content-identity between descriptions, and thus begs the question for Fodor. In the context at hand, however, the strategy is arguably still viable if the descriptions are individuated referentially and the proposal is that concepts are similar in sense if some but not all of the descriptions so individuated are shared. If so, the Fregean can claim that there is a chain of sense similarity running from B's first Paul concept via the concepts of D and T to B's second Paul concept, without there being sense similarity between B's first and his second Paul concept. This prina facie allows the Fregean to jointly endorse the claims (1) to (3) above rewritten with sense similarity instead of sense identity.

[39] It is arguably not beyond his epistemic reach in the case as described, given that B is present when D interacts linguistically with T, but the case can be easily adapted to satisfy this condition.

The second, and more specific, worry is to properly apply this strategy to the case at hand. How can a Fregean make a plausible case for the claim that the concepts in question are relevantly similar between B, D and T while both B's concepts are nonetheless relevantly dissimilar? How exactly are the concepts between B, D and T alike in a way that renders both B's concepts sufficiently unlike each other? Unfortunately for the Fregean, there appears to be no reasonable answer to this question in the case as described. This means that the envisaged strategy fails to make a plausible case for the similarity claims that are necessary to defend a Fregean semantics. It follows that while the sense similarity option is theoretically possible to avoid the problem of transitivity failures, it is nonetheless a response that is explanatorily inadequate.

The second option for the Fregean is to refrain altogether from the claim that sameness of sense is necessary for successful communication, maintaining instead that co-reference is sufficient. As mentioned, this strategy is surprisingly common in the literature[40]. However, it is clearly not viable as a general criterion for successful communication, if else a potential linguistic interaction between two Ancient Greeks in which one speaks about Phosphorus and the other interprets him or her as speaking about Hesperus would qualify as successful. Perhaps the proposal can be improved by claiming that only sameness of reference that is known to both interlocutors is sufficient, as it would exclude the case of the Ancient Greeks from successful communication. An initial observation, however, is that this proposal is no longer a defense of a Fregean semantics, as senses are then theoretically idle. Acordingly, a Referentialist could propose the same idea. There are presumably good reasons, however, that Referentialists such as Fodor have avoided this idea. The main worry is arguably that it is hard to make plausible in a Language of Thought based framework. The knowledge required by the interlocutors would involve the semantic properties of the mental representations of others, which are not plausibly taken to be epistemically accessible in conversation. How could a hearer possibly know what the underlying mental representation of the speaker refers to? The plausible fact that the relevant co-reference can never be really known indicates that known co-reference cannot serve as the theoretical basis for successful linguistic communication.

Since both options are of no help to the Fregean, the case amounts to an incompleteness proof for a Fregean theory of senses in view of the semantic facts. Speaking generally, the description of the semantic facts in a Fregean framework is either complete or consistent but not both. It is important to note that this problem does not depend on any of the concerns mentioned previously. Instead, it is entirely due to the limited explanatory scope of the Fregean framework. The argument is also independent of the specific version of Fregeanism endorsed, as shown by the fact that it undermines even the most minimal version proposed by Sainsbury. Whatever view a Fregean holds about the nature of senses or their relation to modes of presentation, a fundamental and universally shared assumption is the explanatory role of the sense-identity relation. However, the case shows that the transitivity of the sense-identity relation is in fact the major obstacle for a viable Fregean semantics for the Language of Thought.

The conclusion of this chapter is therefore that Fodor is right in being skeptical regarding a Fregean semantics for the Language of Thought, if mostly for reasons he fails to notice, which are brought out by Kripke and Fine instead. Arguably, the best defense Fregeans can offer for their semantic theory at this point is to stress that Referentialism is not a viable option either. In other words, a Fregean can maintain that Fregeanism remains the best semantic theory available so far, even

[40] See for instance (Sosa 2010: 355) or (Taschek 1998: 348, footnote 28).

if it posits a special realm of objects with privileged epistemic access and it has to be accepted that it cannot accommodate all possible cases in a semantically satisfactory way. While this is a reasonable point to make against the Referentialist, the application of a Relationist semantics to the Language of Thought, which is the topic of the next chapter, undermines this defense of a Fregean sense theory for the Language of Thought.

Chapter 6

Semantic Relationism and the Language of Thought

6.1 A Relationist Semantics for the Language of Thought

The main aim in this chapter is to argue that Semantic Relationism constitutes the right semantic theory to serve as a theory of content for the Language of Thought. In view of the problems described for the alternative theories, notably Referentialism and Fregeanism, the pivotal idea is to base the type-identity of concept tokens on the semantic relation of coordination. In other words, two concept tokens, which are word-like Language of Thought symbols, are of the same type if and only if they are co-referential and coordinated. Strictly speaking, coordination is sufficient for type-identity given that it entails co-reference. Hence, being coordinated constitutes both a necessary and a sufficient condition for type-identity. This yields as a principle that two concept tokens are type-identical if and only if they are semantically coordinated.

On the proposed view, concepts, which are mental representations with syntactic properties, do not only have the semantic property of referring to extra-linguistic objects, they also stand in semantic coordination relations to other concept tokens. If the two concept tokens between which a coordination relation holds belong to the same mind, the extrinsic content of concepts can be the intrinsic content of complex thoughts. Hence, the semantic relation that holds between two concept tokens can be the semantic property of a complex thought. For instance, the self-evident identity thought that Phosphorus is Phosphorus has the semantic property of having two coordinated basic constituents, unlike its non-obvious equivalent, which does not have the semantic property of having two coordinated basic constituents. Not all extrinsic features of content have an intrinsic counterpart, however. The semantic coordination relation that holds between concept tokens of different minds, for instance, is never the property of any one thought, as thoughts are always complex structures fully contained within individual minds. Extrinsic content does thus not generally have as a counterpart an intrinsic content. Importantly, this semantic approach to the Language of Thought is Fregean in the sense that it postulates a two-tier semantics with reference and coordination, but it is not Fregean in the sense that it posits senses. This means that the question whether Semantic Relationism is ultimately a version of Fregeanism or not is largely moot, as it depends exclusively on the way Fregeanism is defined, either as a semantic theory with

senses or as a semantic theory with two levels of semantic content.

The positive upshot of using Semantic Relationism as theory of content for the Language of Thought is twofold. Firstly, and in contrast to Referentialism, it provides a notion of semantic content that can be used to appropriately type-individuate co-referential concepts, and so distinct thoughts about the same objects as well. Secondly, and in contrast to Fregeanism, it offers a notion of content that properly takes into account the transitivity failures revealed by Kripke's variants of Frege's Puzzle. The upshot for the theory of linguistic communication is that the thoughts underlying the competence in a natural language can be correctly individuated. In the basic case, an instance of linguistic communication is successful if and only if the hearer ends up with a token of the same type of thought as the speaker, say, a token of the thought type that Phosphorus is a star. In terms of psychological laws, token concept and thoughts can also be adequately type-individuated. As a result, mental states such as beliefs, which contain thoughts and concepts as constituents, can be properly type-individuated as well, as required to account for the explanatory and predictive success of the psychological laws involving mental states such as beliefs and desires. More specifically, the main advantage of Semantic Relationism over the various versions of Referentialism is that it provides a general solution to the intersubjective variants of Frege's Puzzle for the Language of Thought. The main advantage over Fregeanism is that can solve Kripke's variant of Frege's Puzzle for the Language of Thought in a way that is both complete and consistent.

In its defense of a Relationist solution to Frege's Puzzle for the Language of Thought, the proposal adopts a modest explanatory approach advocated in a similar fashion by Sainsbury (2002: 8). The key concern is the explanatory role of semantic coordination, and hence of the semantic theory more generally. Even though the semantic relation of coordination ultimately provides the semantic basis for an explanation of phenomena such as the correctness of a linguistic interaction or the relevant sameness of a concept for the sake of a psychological law, this does not mean that the assumed correctness of an interpretation or sameness of concept cannot in turn serve as the actual evidence for the assumption that semantic coordination holds in a given case. In fact, in terms of a given psychological law, the theorist can start with a judgment that the concept tokens of two individuals are type-identical in view of that law to derive the judgment that they are semantically coordinated. The explanatory approach of the semantic theory is thus modest in that it does not always explain judgments of type-identity beforehand, but instead sometimes makes use of them to motivate the underlying semantic claims. This does not mean, however, that concept tokens are coordinated because they are type-identical. Ontologically speaking, the view remains that coordination explains the type-identity of concept tokens. Two concept tokens are type-identical because they are coordinated, even if often it is only possible to know that they are coordinated as they are judged to be type-identical beforehand. With a proper distinction between ontological and epistemological facts, however, there is no circularity in this approach, nor does it undermine the claim that coordination explains type-identity in a substantial way.

Before going into the details of a Relationist approach to the content of the Language of Thought, a final caveat on the scope of the proposed solution to Frege's Puzzle. First of all, the proposal extends only to the type-individuation of referential expressions, as should be obvious from the fact that semantic coordination captures semantically required co-reference. This determinately includes the equivalents of natural language proper names in the Language of Thought, often called singular concepts, which have been used exclusively in the examples so far. Arguably, it includes predicates

as well, on the reasonable conjecture that predicates refer to properties rather than to sets of objects that have the property in question[1]. In contrast to the assumption of Fine and others, however, it does not include indexical or anaphoric expressions (Fine 2009: 122)[2]. The main reason is that on the current proposal, indexicals are not part of the Language of Thought. That way, the proposed solution sidesteps expressions that are either not part of the Language of Thought or not referential. An example of the latter sort are the Language of Thought equivalent of parenthesis in formal languages which are arguably necessary to mark scope[3]. Such symbols, which do not refer and so do not stand in coordination relations either, require an alternative criterion for type-identity, which the main proposal by itself does not provide. A reasonable criterion for the type-identity of scope marking symbols in the Language of Thought is their functional or computational role, which is to say that the two symbols that mark scope in two distinct individuals are type-identical as they both function as scope markers in their respective cognitive systems. In saying this, the goal is not to make a definite commitment to the existence of such expressions in the Language of Thought, nor to the adequacy of functional role to determine their type-identity. The main point is rather to emphasize that even if such expressions are expressively not covered by the current proposal for type-identity, it does not entail that such expressions are therefore problematic for it.

Importantly, it also does not mean that the theory is beset by arbitrary limits of applicability. The examples presented in the previous chapter show clearly how functional role fails as a general criterion for the type-identity of Language of Thought symbol tokens. It is plausible to assume that the reason for this failure is the fact that the outward role a concept has in communication can override its inward role within an individual cognitive system, as determined by its functional, conceptual or inferential role. This happens for instance in case two subjects are such that what one believes to be true for Hesperus the other believes to be true for Phosphorus and vice versa. In that case, the outward role of concepts requires that the tokens are type-distinct, even though they are identical in terms of their inward functional role. This has two important consequences. As explained, it first of all shows that functional role cannot be used as a general criterion for type-identity, as the outward role of concepts in communication can override the inward functional role. Secondly, however, it also suggests that functional role can be used as a criterion for type-identity if the concepts either do not refer, and hence they do not stand in coordination relations, or if they play no explicit role in communication. Coordination can override the functional role of symbol tokens in the determination of type-identity only if they are available explicitly for referential purposes in communication, which means that for mental symbols not so available, coordination is neither possible nor necessary. Hence, a functional role based approach to type-individuation works for Language of Thought symbols precisely if and because they do not stand in semantic coordination relations. That way, the application of a Relationist semantics to the type-identity problem of Language of Thought symbols and its limits can be systematically accounted for.

Having already explained the basic intuition behind a Relationist semantics for the Language of Thought, the reminder of this chapter is structured as follows. First, the crucial distinction between intrasubjective and intersubjective coordination is highlighted. It is then explained how coordination holds in virtue of non-semantic facts in dependence of the type of coordination in question.

[1] See Sullivan (2005) for a good defense of this assumption.
[2] See also Pinillos (2010).
[3] They are necessary to mark the difference in scope, for instance, between the thought that John thinks that (Peter is happy and Frank is happy) and the thought that (John thinks that Peter is happy) and Frank is happy.

The main aim is not to offer a comprehensive metaphysics of coordination, but rather to explain how certain systematic differences within the semantic theory depend on the underlying facts that ground each type of coordination. The third section then finally shows how a Relationist semantics can address the various problems highlighted by the examples used against both Referentialism and Fregeanism in the previous chapter. Subsequently, the chapter briefly mentions some important philosophical consequences that result from this view for two very well-known and controversially discussed topics, namely Twin cases and animal concepts. In each case, the Relationist approach suggests a view that differs promisingly from the main positions offered in the literature so far. In doing so, the overarching aim is not to provide a conclusive or even comprehensive discussion of these complex topics. The purpose is rather to show that the application of a Relationist semantics to the Language of Thought is not without broader philosophical consequences beyond the main topic of the proposal, which is the problem of type-identity in the face of Frege's Puzzle for the Language of Thought.

6.2 Intrasubjective and Intersubjective Coordination

The most significant distinction for coordination holds between intrasubjective and intersubjective coordination. The distinction depends exclusively on whether the symbols that are the relata of the coordination relation belong to the same or distinct minds. Hence, the distinction is very straightforward. Whenever the two coordinated symbols, which are the bearers of semantic content, belong to the same mind, the resulting coordination relation is intrasubjective, and intersubjective otherwise. As a result, all coordination relations are either intrasubjective or intersubjective. There is no third alternative. The two types of coordination are mutually exclusive and jointly exhaustive. It is important to note that it makes no semantic difference whether a coordination relation is intrasubjective or intersubjective. From a semantic point of view, coordination is always the same semantic relation. Instead, the difference lies solely in the way the relation is constituted by non-semantic facts, that is, in the way the relation is grounded in the facts external to the semantics. Roughly, the idea is that intrasubjective coordination is determined by cognitive and syntactic facts, which are facts about the semantic properties of individual cognitive system. Intersubjective coordination, in contrast, is determined by communicative facts, which are facts about the interaction between mental symbols in linguistic communication. It follows from this that all coordination relations are grounded either in cognitive or in communicative facts, and that no coordination relation is grounded in both or neither of them.

The distinction between the two types of coordination, which Fine refers to as "intrapersonal" and "interpersonal" coordination, largely corresponds to Fine's difference between coordination within thought and coordination between speakers (Fine 2009: 66, 68). However, a major difference is that on the proposed view, the relata of a coordination relation are exclusively mental representations that are referential symbols in the Language of Thought. The relata of both types of coordination are thus the same, and the difference between the two types merely depends on whether these symbols belong to same mind or not. Fine, in contrast, also envisages coordination between language and thought in the case of coordination between speakers. As a result, for Fine mental representations can be coordinated with natural language expressions (2009: 86). In this respect, the proposed view deviates from Fine, as it endorses Fodor's view that natural languages do not

have semantic content strictly speaking (Fodor 1998: 9). On the view proposed by Fodor, only the underlying thoughts have semantic content, which entails that only Language of Thought expressions are the relata of coordination relations. Rather than being a matter of semantic content, the relation between language and thought is a matter of linguistic meaning. Roughly, linguistic meaning constitutes a conventional association between a natural language expression and an expression of the Language of Thought. Competence in a natural language requires the ability to properly connect a natural language expression with its appropriate Language of Thought expression. That way, linguistic competence is largely a translational capacity, as it requires the proper translation from one language, a natural language such as English or German, into another, the Language of Thought. The theory of semantic content, in contrast, is not concerned with the relation between languages, but rather with the relation between a language and its content, which is at least partly constituted by a relation between that language and extra-linguistic reality. The upshot is that even intersubjective coordination only holds between the constituents of thought. Intersubjective coordination is mediated by natural language expressions, but it does not contain them as relata. A fortiori, there is no coordination that holds between the constituents of thought and natural language either[4].

The next section explains how each type of coordination is ontologically determined by non-semantic facts. The aim is to explain, by virtue of the notion of grounding, how symbols are coordinated, which is basically to explain how it is that they are semantically required to co-refer. Intuitively, the requirement underlying intrasubjective coordination translates into the self-evident requirement for identical symbols within a mind to have the same reference as a matter of semantic necessity. Identical symbols are semantically required to be co-referential. The corresponding requirement for intersubjective coordination applies to token concepts of distinct minds as they underlie the use of a proper name in conversation. It requires the token concept used to interpret a natural language proper name by a hearer to be coordinated with the token concepts used by the speaker in the production of the proper name. It thus requires the token symbols of both the speaker and the hearer to be co-referential as a matter of communicative necessity. This requirement extends to psychological laws as well, in that it requires token concepts that are type-identified for the purpose of psychological laws to be appropriately connected in communication, thus providing the fineness of grain necessary to properly make sense of humans' cognitive capacities and their (possibly joint) behavior by means of psychological generalizations. Even if the theoretical relevance of coordination depends on the type of coordination in question, it is important to reemphasize that the semantic co-reference requirement does not differ semantically. Coordination is the same semantic relation whether the relata belong to the same mind or not. Hence, the difference in type is of no significance within the semantic theory. Instead, the difference is important, first, in terms of the ulterior relevance of the semantic relation beyond semantic theory proper, and secondly, in terms of the way the semantic coordination relation is constituted by non-semantic facts, which is again a matter that goes beyond semantic theory. The difference in theoretical relevance between the types of coordination has already been explained on the basis of the differing relevance of intrasubjective and intersubjective type-identity. How the difference affects the way semantic facts are grounded in non-semantic facts is the topic of the next section.

[4] The motivation for Fodor's approach cannot be stated briefly. Fodor's key point is that there are advantages to assigning content only to mental representations, both in terms of explanatory adequacy and ontological parsimony.

6.3 Grounding Coordination

6.3.1 The Notion of Grounding

The goal in this section is to shed light on the ontological basis of coordination through the notion of grounding. The grounding relation is fundamentally a non-reductive and non-causal relation of metaphysical dependency. The sections starts with an explication of the general notion of grounding in reference to a paper from Audi (2012). It is followed by a more detailed discussion on the way the semantic facts that involve coordination can be grounded in non-semantic facts, which depends essentially on whether the coordination relation is intrasubjective or intersubjective.

Before describing the general notion of grounding, the following caveat is in order. Although this chapter often mentions the grounding of semantics facts in general, it is actually concerned only with the grounding of facts about semantic coordination. Hence, it proposes no view on the possible grounding of other semantic facts, such as facts about the reference of linguistic expressions. The grounding of referential facts is evidently a major topic in itself, which is discussed extensively in the literature (Adams and Aizawa 2010). A well-known proposal in this respect is offered by the different variants of informational semantics, which are based on the idea that semantic facts about the reference of mental symbols can be grounded in causal facts, for instance facts about which extra-linguistic types of object reliably cause the tokening of a mental symbol. The current proposal undertakes no commitment in this regard. It is not committed to the claim that referential facts are grounded in causal facts in the way proposed by informational accounts. In fact, it is not even committed to the view that referential facts can be grounded in this way at all. The justification for this noncommittal approach is the fact that Semantic Relationism poses no special difficulty in this regard. Whatever account for grounding reference proves ultimately successful, if any, there is no reason to suppose that it cannot be employed for Semantic Relationism as well. It therefore makes sense to focus exclusively on the grounding of the notion that is distinctive of a Relationist semantics, which is semantic coordination.

According to Audi, the grounding relation captures a non-causal relation of metaphysical determination that serves as the basis for the "in virtue of" locution that occurs in many explanations:

> "[T]here is a non-causal relation of determination, grounding, often expressed by the phrase 'in virtue of'."
> (Audi 2012: 1)

Importantly, for Audi both grounding and grounded entities are real in a very substantial sense:

> "[G]rounded facts and ungrounded facts are equally real, and grounded facts are an "addition of being" over and above the facts in which they are grounded. The mere fact that some entity is grounded does not make it any more (or less) ontologically innocent. The grounded is every bit as real - and real in precisely the same sense - as that which grounds it."
> (Audi 2012: 2)

Audi's motivation for making this point is to emphasize that grounding as he understands it cannot be used for reductionist purposes. In the semantic case, this means that the claim that a semantic fact is grounded in a given non-semantic fact does not render that semantic fact any less real.

The grounded semantic entities or relations are thus just as much part of reality as the entities or relations that ground them.

For Audi, grounding represents a relation that has an explanatory role in metaphysics, which has two important consequences (2012: 2-3). First of all, the relation holds asymmetrically, in that a grounded fact cannot itself ground the fact that grounds it. The reason for the asymmetry is the explanatory role of grounding. If one fact is used to metaphysically explain another, then that other fact cannot in turn be taken to explain the initial fact, if else circularity would undermine the overall value of the metaphysical explanation offered. Secondly, grounding can only hold between distinct facts. The reason is again the explanatory role of the relation. It can only hold between distinct facts because no fact can explain itself, or more cautiously, because no fact can be explained by the fact that it is grounded in itself. So if there are fundamental facts, which are facts that are not grounded in other facts, this entails that it should be maintained that these facts are ungrounded rather than that they are grounded in themselves, so as to avoid the suggestion that grounding provides a substantial metaphysical explanation in the case of fundamental facts.

What then is the explanatory role of grounding? In Audi's view, the relation of grounding is needed to answer metaphysical why questions. For instance, the round shape of a ball explains why it has the propensity to roll, by virtue of the claim that its disposition to roll is grounded in its round shape (2012: 4). For semantic purposes, it is important to add, however, that the why question is a purely metaphysical question, which means that the answer provided in terms of grounding is purely metaphysical as well. In other words, a claim that some semantic fact is grounded in a non-semantic fact should not be taken as the suggestion that the semantic fact is fully explained by the non-semantic fact in the sense that the non-semantic fact explains its own semantic relevance. An example can clarify this. A major claim, which will be discussed in greater detail later on, is that intrasubjective coordination is grounded in syntactic symbol identity. This means that the syntactic identity of two symbols explains why they are semantically coordinated. This does not mean, however, that the syntactic identity of the symbols explains why for example it is irrational to reject an identity thought that contains an identity sign flanked by two identical symbols. The irrationality is due to the content of the identity statement, but the identity of the symbols is not a part of the content of the thought, but is part of its vehicle instead. In the ball example, there is presumably nothing more to the disposition to roll than the shape of the object, so that the shape of the object can be taken to fully explain the disposition to roll. In the semantic case, in contrast, the explanation is restricted to a purely metaphysical explanation. In the example, there is more to symbols being coordinated than being syntactically identical, as evidenced by the fact that the former is a matter of content, while the latter is a matter of representational vehicle. In consequence, it is arguably preferable to maintain, at least in the case of semantic facts, that the grounding relation answers how rather than why questions. Grounding answers the question how semantic facts are metaphysically related to non-semantic facts, for instance syntactic facts. The explanatory value of grounding semantic facts in non-semantic facts is accordingly limited. It explains how semantic facts hold, which explains what non-semantic facts coordination facts are based on, but it does not explain why they hold, which is to explain why in some cases identical symbols have a given semantic content.

As mentioned, a major claim is that intrasubjective coordination is grounded in syntactic symbol identity. More precisely, the claim is that the fact that two symbols are intrasubjectively coordi-

nated is grounded in the fact that they are syntactically identical. The limited explanatory function of grounding is also due to the fact that sameness of symbol does not necessitate semantic coordination, nor does semantic coordination metaphysically require syntactic identity. Other options are imaginable as well. For instance, distinct symbols could be coordinated within a cognitive system by means of a much more complicated scheme, which is possible as long as the scheme is unambiguous, that is, as long as it is always determinate whether two distinct symbols are coordinated or not. This entails that coordination is metaphysically independent of syntactic symbol identity, which is why it cannot be taken to hold because of it. The proposal that intrasubjective coordination is nonetheless grounded in syntactic symbol identity is based on the underlying assumption that in the case of actual cognitive systems, such as human minds, coordination is in fact realized by means of symbol identity as a matter of empirical fact[5]. What is explained by grounding, then, is, in a sense, the way a cognitive system is able to keep track of semantic coordination relations. In that way, the non-semantic fact of syntactic symbol identity explains how the semantic fact of coordination holds, but not why it does. In this regard, the notion of grounding adopted for current purposes is arguably weaker than what Audi proposes. As used here, the notion of grounding does not include a metaphysical commitment to the claim that the grounded semantic facts hold because of the non-semantic facts that ground them, but only to the weaker claim that the grounded facts hold in virtue of the non-semantic facts that ground them[6].

Audi also offers reasons to assume that the grounding relation exists. According to Audi, grounding is necessary in that it provides the foundation for metaphysical explanations that are non-causal in nature (2012: 4). For instance, the spherical shape of a ball metaphysically explains its disposition to roll, but it does so without being a cause to which the disposition is the corresponding effect. A major motivation for this view is that causation relates causes and effects that are temporally separated, but the shape of an object determines its disposition to roll instantly rather than at a later temporal stage. On the current proposal, the same non-causal relation of determination also exists for semantic facts. The fact that two symbols are syntactically identical within a given mind grounds the fact that they are semantically coordinated without syntactic symbol identity being the cause of coordination in a temporal sense. It is important to keep in mind, however, that the overarching aim here is not metaphysical, for two reasons. First of all, the purpose here is not to defend the merits of the metaphysical relation of grounding in general, but to ascertain its explanatory value in terms of accounting for how semantic facts depend on non-semantic facts. Secondly, even within the semantic domain, the metaphysical explanation is not of primary importance. Rather, grounding is adduced above all to explain differences that are of systematic relevance within the semantic theory. More precisely, there are systematic semantic differences between intrasubjective and intersubjective that are explicable only by virtue of the different ways both types of coordination are grounded in non-semantic facts.

A final claim Audi makes is that grounding holds between facts rather than relations or properties:

> "[T]he relata of grounding [are] facts, understood to be things' having properties and standing in relations."
> (Audi 2012: 8)

[5] This is in turn justified by the assumption that it represents the simplest and hence most plausible way for a cognitive system to realize semantic coordination.

[6] That said, it is not exactly clear to what extent this actually differs from what Audi proposes, or whether the difference is merely terminological in terms of how to interpret the relevant why. See also the next point about causation.

In Audi's view, the property of having a spherical shape does not ground the dispositional property of being able to roll, but the fact that the ball is spherical grounds the fact that it has the disposition to roll (2012: 4). Given the aforementioned secondary role of metaphysical concerns, the issue about the proper relata of the grounding relation is largely irrelevant for current purposes. The proposed view is neutral with respect to the question whether the grounding and grounded entities are ultimately semantic facts or semantic relations. For convenience, the exposition will largely follow Audi in the view that facts are the relata of grounding, for instance in claiming that the semantic fact that two mental symbols are coordinated is grounded in the non-semantic fact that they are syntactically identical. Importantly, even if Audi is ultimately correct about the proper relata of grounding, however, it remains acceptable to speak of one relation grounding another as long as this is understood as a shorthand for the claim that the fact that one relation holds grounds the fact that the other relation holds. So while the question about the proper relata of grounding is metaphysically of great significance, the ability to speak about the grounding of facts and relations interchangeably in this way entails that for the semantic purpose at hand, nothing hinges on settling the metaphysical issue.

As indicated, a pivotal claim about the grounding of coordination is that it depends fundamentally on the type of coordination on which non-semantic facts the facts about coordination are grounded. The basic idea is that intrasubjective coordination is grounded in syntactic facts, while intersubjective coordination is grounded in communicative facts. More specifically, an intrasubjective coordination relation holds between two mental symbols in virtue of their syntactic identity. An intersubjective coordination relation, in contrast, holds between two mental symbols in virtue of their aligned involvement in linguistic communication. In short, mental symbols are intrasubjectively coordinated because they are identical symbols, and intersubjectively coordinated because they are suitably connected through linguistic interaction.

An important aspect emphasized earlier about grounded entities is that they are metaphysically independent of the entities that ground them and empirically no less real. For the semantic case, this means that a given semantic fact of intrasubjective coordination holds over and above the syntactic fact that the same symbol is used twice. Similarly, a given semantic fact of intersubjective coordination holds over and above the fact that two symbols are connected in the right way through linguistic communication. As a result, empirical reality consists of semantic coordination facts in addition to the syntactic and communicative fact that ground them. Hence, empirical reality contains coordination relations in exactly the same way that it contains the mental symbols that are its relata. This understanding of grounding accords with the naturalistic yet non-reductionist approach to semantic theory already explained before.

A final remark is that the motivation Audi sees for positing a grounding relation is present for facts about coordination as well. In the case of intrasubjective coordination, for instance, the semantic fact that two mental symbols are coordinated holds in virtue of the fact that the two symbols are syntactically identical, but the semantic fact is not caused by the syntactic fact. Rather, the syntactic identity of the symbols provides a metaphysical explanation as to how it is that the two mental symbols stand in the semantic relation of coordination. Hence, whenever the locution "because" is used in this context, as in the claim that two mental symbols are coordinated because they are syntactically identical, this is meant in a non-causal sense of "in virtue of" that captures the non-causal metaphysical grounding relation. With this general notion of grounding in place,

the next step is to spell out in more detail the relationship between intrasubjective coordination and syntax.

6.3.2 Intrasubjective Coordination and Syntax

The metaphysical connection between intrasubjective coordination facts and non-semantic facts is based on the fact that intrasubjective coordination is grounded in the relation of syntactic symbol identity. More precisely, it is true, for human minds as a matter of empirical fact, that syntactic symbol identity is both necessary and sufficient for semantic coordination[7]. As a result, all syntactically identical mental symbols within a mind are coordinated, and all coordinated symbols are syntactically identical[8].

What is the motivation for the claim that intrasubjective coordination is grounded in syntactic symbol identity? First of all, it offers an account of how semantic facts about coordination are metaphysically related to non-semantic facts. At the same time, this is an account of how (some of) the semantic properties of mental symbols are determined by their syntactic properties, which explains how the content of mental symbols is partly determined by the properties mental symbols have as bearers of content. That way, the proposal also offers an explanation as to how the semantic relation of coordination, which is part of the content of mental symbol pairs, as well as of the complex thoughts that contain them, is computationally accessible to the mind, as required by a computational theory of mind. Put differently, a cognitive system can "know" about the semantic coordination between its mental symbols by means of its access to the syntactic properties of those symbols. That way, the grounding of coordination in syntactic symbol identity accounts for how a mind is able to keep track and make computational use of the semantic relation of coordination.

It is important to note that coordination is not grounded in the individual syntactic identity of symbols, but in the identity relation that holds between the distinct occurrences of the same symbol[9]. This clarification is necessary to properly take account of the fact that the identity of individual symbols as such is semantically irrelevant. What matters is not which symbols is used, but whether a given thought contains the same symbol twice or not. So the fact that a given symbol, say the symbol HESPERUS, is encoded in a specific way in a cognitive system is in and of itself without semantic significance. The same is not true for the fact that the same symbol is used twice in a complex thought, however, as in a thought such as HESPERUS IS HESPERUS. An important

[7] This connection explains why it makes sense for Fodor to attempt to reduce sense-identity to syntactic symbol identity. The reason his attempt ultimately fails is that intersubjective coordination is not so grounded, which means that coordination in general is not either. As a consequence, Fodor's overall attempt to avoid a two-tier semantics by appealing to the syntax of mental representations is unsuccessful as well.

[8] To be more precise, this applies to all symbols within a mind that can in principle be coordinated, which is to say that they belong to the same mental module. Perhaps syntactically identical symbols in different modules in the mind are not coordinated despite being identical. Since the proposal here is restricted to the mental representations that account for linguistic competence by providing the necessary deep structure as strings in the Language of Thought, this further restriction is arguably redundant, as it is reasonable to assume that all mental symbols that account for linguistic competence in this way are contained in one unique mental module. If that turns out to be incorrect, however, the principle can easily be adjusted to take into account the modularity of the mind. For the sake of convenience, the assumption is that only one mental module is involved.

[9] Identity is an ambiguous term in this regard. On the one hand, it is used to describe something like a property or a set of properties that uniquely determines an object. On the other hand, it is used as a relation between objects, which is such that every object stands in this relation with itself and with no other object. Coordination is grounded in identity in the relational sense. The fact that the former is more widespread in common parlance is presumably due to the fact that the latter is hardly useful to say something meaningful in everyday communication.

result of this is that the claim that coordination is grounded in the syntactic identity relation does not contravene the multiple realizability of content. The multiple realizability of content captures the plausible idea that any symbol can express any content as long as the type is adequate (a proper name for an object, a predicate for a property and so on). In this sense, the connection between a linguistic symbol and its content is said to be arbitrary or nonnatural. The multiple realizability of content only requires the arbitrariness of individual symbols, however. The claim that coordination is grounded in syntactic identity, in contrast, is based on the non-arbitrariness of expression pairs. Hence, there is no conflict between both principles[10].

Moreover, and more importantly, grounding also helps to explain important systematic differences within the semantics. To be exact, it explains two very significant differences between intrasubjective and intersubjective coordination in terms of the transitivity as well as the negation of coordination. As regards transitivity, the main point is that intersubjective coordination is not necessarily a transitive relation, while intrasubjective coordination is. In the intrasubjective case, this entails that if one mental symbol is semantically required to be co-referential with a second, and that second symbol is semantically required to be co-referential with a third symbol, then there is necessarily a semantic requirement on the first symbol to be co-referential with the third symbol as well. In contrast, this is not generally true for intersubjective coordination. As a result, it is possible to have cases of semantically blameless transitivity failures when intersubjective coordination is involved, but not otherwise. An example of a semantically faultless transitivity failure was given with the case about a teacher and his two students used against Fregean sense theories. In that case, one subject, the believer, has two distinct, uncoordinated symbols for an object even though his concepts are both part of a coordination chain that runs from one concept to the other via the concepts of the disbeliever and the teacher[11]. As a result, there is a clear failure of transitivity, but no semantic fault is attributable to any of the participants[12]. The case features no misunderstanding in communication nor a case of irrationality on the part of the individual participants. Speaking figuratively, the coordination chain is interrupted in the believer, but nobody can be blamed for this outcome by any reasonable semantic standard.

As explained, this shows that a semantic theory has to acknowledge that in some cases it can be semantically acceptable for subjects not to coordinate mental symbols even if they are in fact part of a continuous coordination chain. This in turn motivates the claim that coordination is not a transitive relation in general, unlike its Fregean counterpart, sense-identity. For the sake of theoretical adequacy, however, it is important to note that the same kind of semantically faultless transitivity failures are impossible if only intrasubjective coordination is involved. While it is notoriously tricky to prove a negative existential, the point is that it is hard to imagine a case in which a chain of intrasubjective coordination can be broken without there being some kind of semantic failure. It is thus very plausible to assume that whenever there is a transitivity failure in the case of intrasubjective coordination, a semantic mistake has been committed. To see this, one

[10] Fine makes a similar observation about variables in formal languages (2009: 11). While it is arbitrary which symbol is chosen to represent a variable in the first occurrence, the same is not true for the second occurrence. That is why "x>0" is only typographically but not semantically distinct from "y>0", while "x>x" is semantically distinct from "x>y". Variable symbols are arbitrary individually but not pairwise.

[11] As explained, the assumption that both believer's concepts are so connected is required to properly account for the linguistic interaction between the believer, the disbeliever and their teacher.

[12] The transitivity failure lies in the fact that there is an indirect semantic requirement for the two concepts of the believer to be co-referential but there is no direct such semantic requirement for the believer. Hence, the relation "x is semantically required to be co-referential with y" is not transitive.

can imagine a person who doubts whether conclusion (3) follows from the premises (1) and (2):

(1) a is F

(2) a is G

(3) a is F and G

The reason this person would adduce for doubting the conclusion is that while she realizes that the occurrence of "a" in the first premise is coordinated with the occurrence of "a" in the second premise, and that the second occurrence of "a" is coordinated with the occurrence of "a" in the conclusion, she is unsure whether this also means that the "a" in the first premise is coordinated with the "a" in the conclusion. Hence, her motivation for refraining from endorsing the conclusion is that she is unsure whether the object to which "a" refers in the conclusion is still the same as the object to which the "a" refers in the first premise, despite her knowledge that the object referred to by "a" in the first premise is the same as the object referred to by "a" in the second premise and her knowledge that the object referred to by "a" in the second premise in the same as the object referred to by "a" in the conclusion. Clearly, this putative reasoning should count as irrational[13]. If intrasubjective coordination were not a transitive relation, however, the doubt could be legitimate from a semantic point of view. However, that is clearly not the case. In Fine's terminology, transitivity failures are acceptable only if "the relata between which the relation holds may to some extent be opaque" (Fine 2009: 119). This is never possible in the case of a chain of intrasubjective coordination relations, as it entails that all the coordinated symbols are contained within the same mind. As a result, there can be no opacity to allow for semantically faultless transitivity failures. The problem then is how to account for the transitivity of intrasubjective coordination given that coordination is not generally a transitive relation. How can the Relationist maintain that an intrasubjective transitivity failure is always semantically defective when transitivity is in fact not a general feature of the coordination relation?

The most plausible response to this problem is to point to the way intrasubjective coordination is grounded. The basic idea is to maintain that while coordination is not generally a transitive relation, intrasubjective coordination inherits its transitivity from the transitivity of the syntactic identity relation that grounds it. Put simply, intrasubjective coordination is a transitive relation because syntactic symbol identity is. In the example above, the grounding of intrasubjective coordination in syntactic symbol identity means that the occurrences of the referential expression "a" in the two premises are coordinated by virtue of the fact that the same mental symbol is used for "a". The same is true for "a" in the second premise and the conclusion. As a result, the occurrences of "a" in the first premise and the conclusion are also realized by the same symbol, given that any identity relation is necessarily transitive. By reason of the grounding of intrasubjective coordination in syntactic symbol identity, these symbols are then ipso facto coordinated as well. That way, the transitivity of the syntactic symbol identity relation, together with the fact that intrasubjective coordination is grounded in this relation, ensures that intrasubjective coordination is also a transitive relation, even if coordination in general is not. This in turn explains why transitivity failures are always semantically defective if the coordination relations involved are purely intrasubjective.

[13] Performance issues are set aside here, as they do not speak against the point anyway. Transitivity failures due to performance limitations are perhaps not cases of irrationality, but they are still defective, which is precisely the point.

A similar issue arises with regard to the way mental symbols can be related to each other in terms of coordination. As explained before, there are generally three options. Two mental symbols are either positively coordinated, negatively coordinated or neither of those. Positive coordination holds if there is a fact of the matter that two symbols are semantically coordinated. The difference between the two negative options lies in the scope of the negation with respect to factuality. In the case of negative coordination, there is a fact of the matter that two symbols are not coordinated, whereas in the remaining case, there is no fact of the matter whether two symbols are coordinated or not. In that case, the facts about coordination are underdetermined. The motivation for accepting the distinction between negative and underdetermined coordination will be discussed in greater detail in the next section, as well as in a separate section on the consequences of adopting a Relationist semantics for the issues raised by Twin Cases. For now, an intuitive grasp of the two different ways to negate coordination is sufficient to make the point. Assuming that these three options are accepted, it is immediately clear that they do not exist in the intrasubjective case, however, as it makes no sense to maintain that there is no fact of the matter whether two symbols within an individual mind are coordinated or not. How could it fail to be the case that the content of two mental symbols within an individual's mind is such that the symbols are either obviously about the same object or not? A subject is either sure that two mental symbols are about the same object, in which case they are positively coordinated, or he or she is not, in which case they are negatively coordinated. It makes no sense to assume there is a third alternative. As a result, facts about intrasubjective coordination are never underdetermined, which entails there are only two intrasubjective options. Two mental symbols are either positively or negatively coordinated. As in the case of semantically faultless transitivity failures, the fact that there are in general three possible ways for symbols to be coordinated is thus due entirely to intersubjective coordination.

Since positive and negative coordination are not an exhaustive pair of options for coordination in general, a question arises as to how it can be explained that the options are exhaustive in the case of intrasubjective coordination. As with transitivity, the most plausible explanation is based on the underlying grounding relation. Since intrasubjective coordination is determined by the syntactic identity of the symbols, it is evident that there can only be two options. Two mental symbols are either the same symbols or they are not. As a result, they are either positively or negatively coordinated. There is no third possibility. Hence, as intrasubjective coordination is grounded in syntactic identity, for which there is no third option given that two symbols within a mind are either the same or not, the bivalence of syntactic identity is inherited by the intrasubjective coordination relation. In contrast, this is not the case for intersubjective coordination, as it is not grounded in syntactic symbol identity. It is grounded in facts about linguistic communication instead, which allows for two ways coordination can be negated. Two mental symbols are either negatively coordinated by virtue of how they are involved in linguistic communication, or there is no fact of the matter to determine coordination either way for the simple reason that there is no communicative linguistic connection between the bearers of the mental symbols. That way, the grounding facts explain systematic differences within the grounded facts, which makes it possible to explain, in a systematic way, why and how intrasubjective coordination can have features that are not associated with coordination in general. It is important to note that this is explicable in a systematic way only by taking into consideration how the semantic facts about coordination are grounded in non-semantic facts in dependence of the type of coordination in question.

A further reason why the grounding of coordination is important for semantic purposes is the mental status of the intrasubjective coordination relation, which is important to contrast Relationism with Fregeanism as applied to the Language of Thought. The underlying idea is that in terms of mental status, it is plausible to assume that a grounded relation has the same status as its grounding relation. This means that intrasubjective coordination is a mental relation because it is grounded entirely in mental facts, while intersubjective coordination is not, as it is grounded in non-mental facts. The overall aim here is manifestly not to argue for the general principle that grounded facts and relations have the same ontological status as the facts and relations that ground them. In fact, a much more limited argument is sufficient. As a reminder, the motivation for the claim that a relation or property is mental is to make plausible the assumption that it is directly and infallibly accessible to the mind. This idea is the basis for Fodor's claim that whatever distinguishes co-referential concepts must be "in the head", and thus his view that co-referential concepts are distinguished by their mind-internal syntactic properties (Fodor 1998: 15). Because of how intrasubjective coordination is grounded, however, it is also "in the head". Intrasubjective coordination is also directly accessible to the mind by virtue of being fully determined by the mind-internal syntactic properties of mental symbols. Hence, since intrasubjective coordination is grounded in the relation of syntactic identity, which is directly and infallibly accessible, it is itself directly and infallibly accessible to the mind. Accordingly, it is warranted to assume that intrasubjective coordination is part of the mind just as much as the mental symbols between which the relation holds[14]. The contrast with Fregeanism is helpful to clarify this point. As senses are mind-external abstract objects, they are arguably not directly and infallibly accessible. Because of that, the fact whether the senses of two symbols are identical or not is not directly and infallibly accessible either. This is the basis for Fodor's argument against Fregeanism that its explanatory strategy is predicated on the unjustified stipulation that knowledge about senses is infallible (1998: 17). Evidently, the same problem does not arise for intrasubjective coordination. The assumption that it is directly accessible is not based on stipulation, but justified by the fact that it is grounded in the directly accessible mind-internal properties of the mental symbols between which it holds.

Evidently, the proposal is not that if something is directly accessible to the mind, it is metaphysically impossible for the mind to be mistaken about it. Like any other machine, the computational mind is not error-free. The underlying idea is rather that such mistakes are invariably semantically blameworthy. The difference relevant is most conspicuous between intrasubjective coordination and reference in this respect. While it is possible for someone to be mistaken about the identity of referential objects without semantic fault, it is not possible to be blamelessly mistaken about whether two mental symbols are intrasubjectively coordinated or not, just as (and for the very reason that) it is not possible to be blamelessly mistaken about whether two mental symbols are syntactically identical or not. The problem for Fregeanism highlighted by Fodor in this regard is that it requires the identity of senses to be like the identity of mind-internal syntactic properties, but the ontology of senses is such that it is like the identity of mind-external referential objects instead. Semantic Relationism avoids this difficulty. Given how intrasubjective coordination is grounded, it follows that whenever a subject is mistaken about the coordination between two mental symbols, the subject is semantically blameworthy, unlike in the case of mind-external objects. That way, grounding explains why intrasubjectively, transitivity failures and misjudgments about semantic

[14] It goes without saying that facts about intrasubjective coordination are only directly and infallibly accessible to the mind to which the coordination is mind-internal.

coordination are universally semantically blameworthy, in accordance with the normative principle that an "ought" implies a "can".

A final issue for which grounding is significant is the role of semantic notions in causal explanations. Coordination is clearly involved in causal explanations. If someone wants to see Hesperus and believes that Hesperus is visible in the morning, for instance, then his beliefs and desires will cause a certain behavior, say his leaving the house in the morning. The coordination that holds between both HESPERUS tokens is part of the explanation of what caused the behavior, as evidenced by the fact that the same behavior would not have been caused without coordination, for instance in case a person wants to see Hesperus but believes that Phosphorus is visible in the morning. This shows that the difference in the behavior is at least partly explicable by the difference in coordination. With a computational theory of mind, mental processes and the causation of behavior are generally explained by the syntactic properties of mental representations (Fodor 1998: 38). So whenever thoughts have different causal effects, the assumption is that they are syntactically distinct. So in the example mentioned above, the thought that Hesperus is visible in the morning is syntactically distinct from the thought that Phosphorus is (within an individual mind, that is), and that explains the causal difference in behavior. This causal role of syntax explains why Fodor maintains that whatever distinguishes co-referential symbols must be available as "proximal cause (/effect) of mental processes" (Fodor 1998: 15). As argued, however, Fodor mistakenly uses this observation to argue that Frege's Puzzle for the Language of Thought must be solved syntactically. Fodor's mistake lies in the fact that the differing causal impact of co-referential thoughts only shows that there must be a syntactic difference between them, but not that the difference between them is purely syntactic. Hence, it is possible to maintain that co-referential thoughts differ both syntactically and semantically. Fodor himself in fact recognizes this, as he acknowledges that "computations are [...] causal relations among symbols which reliably respect semantic properties of the relata" (Fodor 1998: 10). This means that semantic properties need not themselves be taken to be causally efficacious as long as it can be shown that they are uniquely correlated with the syntactic properties that are. It is thus possible to solve Frege's Puzzle semantically while upholding the causal efficacy of syntactic properties as required by a computational theory of mind.

How can Semantic Relationism take into account the causal efficacy of syntax in a computational approach to the mind? The principle that syntactic symbol identity is both necessary and sufficient for intrasubjective coordination guarantees the required unique correlation between the explanatory semantic relation and the causally relevant syntactic properties. If two symbols are positively coordinated, they will be syntactically identical, and if they are negatively coordinated, they will be syntactically distinct. Consequently, insofar as coordination is concerned, the semantic content is uniquely reflected in the syntactic properties of mental representations. It is thus possible to solve Frege's Puzzle semantically with a Relationist semantics for the Language of Thought precisely because the causal relevance of coordination is explicable by means of the syntactic properties in which coordination is grounded. Coordination is in fact no different from content in general in this respect. The referential content of representations is likewise involved in causal explanations only via the syntactic properties of the mental representation that are the bearers of the referential content. As a result, Semantic Relationism is able to respect the causal constraint imposed by Fodor on any viable solution to Frege's Puzzle for the Language of Thought.

It is interesting to note that the same is not true for intrasubjective coordination, as it is not

grounded in syntax. Intersubjectively coordinated concepts can be syntactically distinct, while syntactically identical concepts can fail to be intrasubjectively coordinated. Intersubjective coordination can therefore not be taken to play a causal role via the syntactic properties of mental representations. It is telling, however, that intersubjective coordination does not need to play such a causal role either. Instead, its principal function is to account for the identity of thoughts across distinct minds. It is therefore not a problem that intersubjective coordination is grounded in a way that does not allow for a causal explanatory role. In fact, it is plausible to maintain that this represents a very strong point in favor of Semantic Relationism, as it cannot simply be a coincidence that only intrasubjective coordination can be grounded syntactically, while it is also only intrasubjective coordination that needs to be so grounded in view of causal explanations.

In conclusion, the grounding of intrasubjective coordination in syntax contributes significantly towards explaining several important semantic features in which the relation differs from its intersubjective counterpart. Before saying more about how intersubjective coordination is grounded, a final observation. In his main work on Semantic Relationism, Fine argues against the idea that coordination is reducible to syntactic symbol identity, which he discusses as the claim that Frege's Puzzle can be solved by appealing to the "logical form" of expressions that is a "pre-semantic" feature of those expressions (2009: 41). It is important to realize that by proposing that intrasubjective coordination is grounded in syntactic symbol identity, the proposal does not take a stand against Fine. The reason is that it appeals to a non-reductive notion of grounding, which entails that the fact that coordination is grounded in a non-semantic relation does not make it any less substantial or real. In line with this, the proposal accepts Fine's main point that syntactic symbol identity is semantically relevant only via the semantic relation of coordination (Fine 2009: 42).

Fine also stresses that one cannot solve Frege's Puzzle by maintaining that it comes down to nothing more than sameness of name (2009: 41). An obvious reason for this is that the same name can be used to refer to different people, as in the case of the philosopher and the shipping magnate both called Aristotle. This shows that sameness of name is not sufficient to guarantee co-reference, let alone obvious co-reference. Fine takes this to illustrate that coordination cannot be based on sameness of name, which is actually the corresponding suggestion made here insofar as intrasubjective coordination is grounded in the sameness of "name" in the Language of Thought. There are two points to make in this regard, however. First of all, the worry raised by Fine regarding the ambiguity of names does not apply to the Language of Thought, as individuals do not use the same Language of Thought symbol to refer to different objects. The ambiguities that are possible in the case of natural language proper names are merely a surface phenomenon without correlate in the Language of Thought. Secondly, the grounding claim defended here applies only to intrasubjective coordination and not to coordination in general. This is important as Fine's point is well taken in the case of intersubjective coordination. Intersubjectively, it is neither necessary nor sufficient to have the same symbol to refer to the same object, so that the same mental "name" can be used to refer to different objects by different people[15]. The proposal is therefore not that coordination can generally be grounded in sameness of "name". That does not mean, however, that intrasubjective coordination cannot be grounded as proposed. Fine's points can thus be accepted as they do not undermine the basic claim defended in this section, which is that, as a matter

[15] This is precisely the reason why Fodor's proposal to solve Frege's Puzzle syntactically fails. The current proposal accepts with Fodor the importance of syntactic symbol identity, but it does not make the mistake of relying exclusively on it.

of empirical fact, intrasubjective coordination is grounded in the syntactic identity of the mental symbols that are semantically coordinated.

6.3.3 Intersubjective Coordination and Communication

Just as intrasubjective coordination is grounded in syntactic facts, intersubjective coordination is grounded in communicative facts, which are facts about the involvement of concepts in the linguistic interaction between speakers. This grounding claim has a positive and a negative part. Negatively, the claim is that syntactic symbol identity is neither necessary nor sufficient for intersubjective coordination. The main motivation for this claim lies in the multiple realizability of content, which entails that there is no intrinsic connection between the physical shape of a symbol and its semantic properties, because of which it is highly unlikely that contents are realized by the same symbol in different minds. The positive part is the idea that the determinative factor for intersubjective coordination is given by facts about how Language of Thought symbol tokens are embedded in the linguistic interaction between speakers. As a result, facts about coordination are universally grounded in empirical and non-semantic facts, which are syntactic facts in the case of intrasubjective coordination and communicative facts in the case of intersubjective coordination.

What are the communicative facts that provide the ground for the facts about intersubjective semantic coordination? An obvious candidate for a communicative fact relevant for coordination holds in case of what Fine aptly calls a derived use of a proper name (2009: 98). On the Language of Thought based approach, a hearer has a derived use of a name if during a conversation she forms a mental symbol in her Language of Thought to interpret a proper name used by a speaker to refer to a person or object hitherto unknown to her, or alternatively, a person or object she fails to recognize as something or someone she is already familiar with. In that case, the hearer's concept is derived from the concept of the speaker, in the sense that the latter is causally responsible for the existence of the former through an instance of linguistic communication. A concrete example is when a hearer learns from a speaker something about an unknown friend of the speaker. In that case, the linguistic interaction causes the hearer to form a mental symbol for the friend to correspond to the mental symbol the speaker has for that person. In Fine's terminology, the hearer's concept for the friend is derived from the concept for the friend of the speaker. In that scenario, the empirical and non-semantic fact that the hearer's concept is derived from the speaker's concept grounds the fact that they are semantically coordinated. Given the explanatory role of grounding, this means that in such a case syntactically distinct concept tokens are semantically coordinated by virtue of the fact that one of the tokens is the cause for the existence of the other. What, however, is the semantic motivation for the claim that the mental symbols of a hearer and a speaker are semantically coordinated in that case? The answer is that coordination captures semantically required co-reference over and above mere factual co-reference, which in this case translates into a semantic requirement on the hearer to have her mental symbol be co-referential with the corresponding symbol of the speaker as a matter of semantic necessity. This is to say that a violation of the semantically required co-reference would render the linguistic interaction between the speaker and the hearer defective from a semantic point of view. The underlying policy for the hearer is simply to align her concepts semantically with the concepts of the speaker in order to correctly interpret what he or she is speaking about.

As mentioned, it is important to emphasize that the underlying notion of necessity is semantic rather than metaphysical. This takes into account that it is obviously metaphysically possible for a hearer to interpret a speaker by means of an uncoordinated concept. The semantic necessity captures the idea that intersubjective coordination is required for success, which is to say that all relevant cases in which coordination fails to hold are defective from a semantic point of view. Defective cases involve some kind of misunderstanding or misidentification on the part of the hearer. The requirement based conception of coordination makes this very clear. Whenever a semantic co-reference requirement is not met, the result is invariably some sort of semantic mistake. Semantic coordination, which holds if co-reference is semantically required, has normative import in this regard.

Even if coordination on the basis of a derived use of a name is arguably the fundamental case, coordination is not restricted to cases where the concept of the speaker is immediately causally responsible for the existence of the corresponding concept in the hearer. It is generally possible for concepts to be coordinated if they are used in communication that is judged to be successful. For example, a hearer's PHOSPHORUS token will be coordinated with the speaker's PHOSPHORUS token as soon as they have a conversation about Phosphorus even if neither concept is directly derived from the other. Whenever an unproblematic linguistic interaction takes place, the fact about the involvement of two concept tokens in such an interaction grounds a semantic fact of co-ordination, even if no concept is directly derived from the other. Hence, the more general principle for hearers is to align their concepts with those of the larger linguistic community. Concretely, this entails for instance that since most PHOSPHORUS tokens within a linguistic community are coordinated with each other through their involvement in communication, while they are not so coordinated with their co-referential HESPERUS counterparts, hearers violate the general coordination requirement, and thus commit a semantic mistake, if they attempt to coordinate their HESPERUS concepts with the PHOSPHORUS concepts of the other speakers. This can happen in case a hearer uses tokens of HESPERUS to interpret the use of the word "Phosphorus" by others, for instance. In this respect, linguistic competence involves the proper conceptual integration with the referential practices of the linguistic community at large.

Importantly, the conformity requirement implies that intersubjective coordination is generally, but not universally, transitive. If A's concept is coordinated with B's concept, which is in turn coordinated with C's concept, and so on, up to Z, then Z's concept should also be coordinated with A's concept to reflect the broader usage of that concept in the linguistic community. In that sense, the demand on individuals to defer to the linguistic majority imposes transitivity as a norm on intersubjective coordination. One reason this does not hold as a matter of universal principle, however, is that there might be no majority to underpin a judgment that the principle has been violated, and therefore that a semantic mistake has been committed. This is shown by the teacher case discussed in the previous chapter, or at least it is supposed to be. It needs to be adapted only minimally to ensure that there is no majority either way so as to make this point very clear. If half the participants have one concept for Peter and the other half have two, how to judge which half uses the name correctly? Importantly, the fact that a unique concept is more accurate in view of the empirical fact that there is only one Peter is linguistically irrelevant, as it concerns exclusively worldly rather than linguistic knowledge. After all, an Ancient Greek who uses HESPERUS to interpret the name "Phosphorus" as used by the rest counts as semantically incompetent even

if his or her use is more correct in view of the empirical (but unknown) fact that Hesperus is Phosphorus[16]. As a result, intersubjective coordination is not necessarily a transitive relation, unlike intrasubjective coordination, which in turn accounts for the non-transitivity of the general notion of coordination. As a result, it is possible for coordination chains containing intersubjective coordination relations not the be "closed", in the sense that a coordination chain can connect two concept tokens that are themselves negatively coordinated without thereby ipso facto constituting a violation of a semantic requirement. This can happen if one cognitive agent has two concepts for a given reference, while others have only one, as in Kripke's famous Paderewski example. In many cases, unclosed coordination chains can evidently be "resolved" to the extent that the minority option can be blamed for being inadequate. In some cases that may not possible, however, for instance if there is no clear majority either way.

A further difference between the two types of coordination is that in the case of intersubjective coordination, both the grounded and the grounding facts are non-mental facts. As such, they involve entities and relations that do not allow for infallible epistemic access by any one cognitive agent. Communicative facts are essentially mind-external empirical facts about how people interact linguistically, about which cognitive agents can have only fallible knowledge, as is generally the case for knowledge about mind-external empirical facts. As a result, such facts are not necessarily within the epistemic purview of a linguistic agent. It is possible for such facts to be inaccessible to a linguistic agent, they can even be inaccessible in principle. The semantics can therefore not impose requirements on an individual agent that require the agent to know all these facts, as a semantic "ought" plausibly implies a semantic "can". How can a subject be blamed for a semantic mistake if the mistake is only apparent on the basis of facts that the subject cannot know? The final case in the previous chapter highlighted this intuition about semantic faultlessness. Neither the believer nor the disbeliever or the teacher can reasonably be said to be irrational or linguistically incompetent. As an adequate semantic theory has to be able to accommodate this semantic state of affairs, Semantic Relationism make use of a coordination relation that can fail to be transitive in certain circumstances, in stark contrast with Fregeanism, which posits a sense-identity relation that is necessarily transitive.

In the previous section, it was explained that two mental symbols are intersubjectively either positively or negatively coordinated, without third alternative. The grounding of intersubjective coordination in facts about communication explains why there are actually three options for the coordination between the mental symbols of distinct subjects. The mental symbols of distinct subjects can either be positively coordinated, negatively coordinated, or neither, in case there is no fact of the matter to determine coordination either way. The two ways to negative coordination exist for intersubjective coordination because the communication between two subjects can either be such that the symbols are negatively coordinated, or it can be the case there is no communication, direct or indirect, to determine facts about coordination to begin with. In the intrasubjective case, this third option is not available as two symbols within an individual mind are either syntactically identical or not, which is in turn sufficient to determine whether they are coordinated or not. As a result, it is not possible that there is no fact of the matter to determine intrasubjective coordination. In the case of intersubjective coordination, it is in fact similarly determinate whether the two mental symbols are syntactically identical or not, but the crucial difference is that syntactic

[16] In this important respect, the proposal differs from a very similar idea offered by Macia, who advocates a universal principle of transitivity for what he calls coordination (Macià 2004).

identity is irrelevant for intersubjective coordination. Syntactic identity only settles intrasubjective coordination. The fact that there three alternatives for intersubjective coordination, however, has important consequences for topics beyond Frege's Puzzle for the Language of Thought, most notably Twin Cases, which are discussed at the end of this chapter.

In contrast to intrasubjective coordination, intersubjective coordination also has no causal import via its grounding relation[17]. However, it is important to realize that a causal role need in fact not to be attributed to intersubjective coordination either. Causal relevance is an issue only for intrasubjective coordination, which, as a mental relation, is a fundamental component of the computational theory of mind, a main objective of which is to explain how mental processes are possible in physical systems determined entirely by causal factors. Intersubjective coordination is required instead to allow for the proper typing of token concepts and thoughts across multiple subjects. This is in turn crucial for the theory of linguistic communication, as it determines the identity of thoughts underlying the principle that successful communication is based on the sharing of thoughts. It is also fundamental for psychological explanation, as psychological generalizations are predicated on the idea that subjects have shared beliefs and desires that systematically account for their behavior. Intersubjective coordination does not play a causal role in either case. As explained, this is based on a crucial distinction between what accounts for the truth of a law and what accounts for its applicability. Putative psychological laws are true because token beliefs and desires cause the behavior predicted by the law. Hence, in terms of truth, intrasubjective coordination plays an important role that is at least partly causal. A law is applicable to a given subject, in contrast, because the subject entertains a set of token beliefs and desires that are of the type that the law speaks about. In terms of applicability, intersubjective coordination is crucial, but not in a causal sense. Intersubjective coordination is needed for the proper typing of thoughts and beliefs in virtue of which a given law is applicable to a certain subject, as it determines whether the subject's mental representation tokens are of the type relevant to the law in question. Intrasubjective coordination, in contrast, is involved in the causal explanation that renders laws true, but the applicability of these laws has to be determined independently by means of intersubjective coordination.

In summary, it depends fundamentally on the type of coordination how coordination is grounded in non-semantic facts. Grounding in turn explains systematic differences between the two types of coordination. It shows why intrasubjective coordination is a transitive relation and why mental symbols are either positively or negatively coordinated intrasubjectively. It also reveals why intersubjective coordination, in contrast, is not generally transitive, and why there are three rather than two options for mental representations to be intersubjectively coordinated. The main motivation to include a proposal on the grounds of semantic coordination in this chapter is not metaphysical, but precisely the fact that it is of systematic relevance for the semantic theory. That way, grounding also provides the basis for the claim made occasionally in this thesis that applying Semantic Relationism to the Language of Thought is to the mutual benefit of both. On the one hand, the Language of Thought hypothesis evidently benefits from a Relationist Semantics that alone allows for a solution to Frege's Puzzle for the Language of Thought. On the other hand, the semantic theory also benefits from the Language of Thought hypothesis, as it makes it possible to explain, via the grounding relation, several systematic features of the semantic theory that are otherwise

[17] An example of such a grounding relation is the relation "being communicatively derived from" that can hold between two mental symbol tokens of distinct minds.

left unexplained. The semantic theory does not by itself explain why some coordination relations are necessarily transitive while others are not. Presumably, it cannot even explain this from within the semantic theory, as the status of a coordination relation as intrasubjective or intersubjective is by itself without semantic significance. The application of the semantic theory to the Language of Thought, which enables the claims about how coordination is grounded, thus has the advantage that it allows for a plausible explanation of systematic differences within the semantic theory.

Incidentally, it is interesting to note that while it is customary and legitimate to divide semantic content essentially into two levels consisting of reference and coordination (or sense), it is now evident that it also makes sense to distinguish between three fundamental dimensions of semantic content[18]. The first dimension is the referential dimension of semantic content, which comprises the object-directed function of a semantic theory. It is objective in the sense that it is confined to the semantic relation that exists between linguistic symbols and extra-linguistic entities. It is incorporated into the semantics through the assignment of referential values to individual expressions, such as objects to proper names or properties to predicates. In common usage, this dimension is familiar from belief attributions that have de re adequacy conditions[19]. De re belief attributions focus purely on the objects in the world a belief is about. As a result, such attributions are correct as long as they pick out the right objects of belief. As an example of a belief attribution with de re adequacy conditions, it is for instance correct to ascribe to someone the belief that Kent is a superhero if he or she believes that Superman is. Since Kent is Superman, it is true that the person believes about this unique person that he is a superhero. As is often pointed out in the literature, there are many cases in which people are interested in nothing more than what entities in the world a belief is about (Soames 1995: 521).

The second dimension is the subjective dimension of content, which takes into account the rational perspective an individual has on the world. It is picked out specifically in belief attributions with adequacy conditions that Fine calls weakly de dicto (2009: 103). Such belief attributions are perhaps the least well-known, but they can nonetheless be useful in certain circumstances. Using the weak de dicto as a standard for adequacy, it is for instance correct to ascribe to someone the belief that Kent is a superhero because Kent can fly if that person believes that Superman is a superhero because Superman can fly. The main contrast here is with an ascription of the belief that Superman is a superhero because Kent can fly. The former ascription, in addition to being de re adequate, as is the latter, also respects the internal conceptual pattern of the belief. Unlike the latter ascription, it uses the same concept in the ascription whenever the same concept also occurs in the belief, even if the concepts in question are not the same but merely co-referential. That way, the belief ascription takes into account what objects the belief is about as well as the rational perspective the ascribee has on these objects. The subjective dimension of semantic content, which takes into consideration the rationality of a subject in his or her perspective on the world, is captured in the semantic theory by the intrasubjective coordination relation. A belief attribution is weakly de dicto adequate in case the belief ascription displays the same coordination pattern as the belief ascribed (Fine 2009: 103). In the semantic theory, coordination is incorporated by the assignment of values to pairs of expression occurrences rather than individual expressions, where

[18] This point is largely based on a similar point Fine makes with a slightly different focus (2009: 114).

[19] When speaking of belief ascriptions or attributions, what is meant is the belief ascribing thought of the ascriber. Ascriptions so understood are thoughts, which contain concepts just as the ascribed beliefs do.

these occurrence are the abstract representatives of the individual tokens of mental symbols[20].

The third and final dimension is the intersubjective dimension of semantic content. It concerns the joint perspective multiple individuals have on the world, which is to say that it adds as a relevant factor the way the concepts of different individuals are related to each other, as evidenced by the linguistic interaction between them. Hence, with this dimension semantics is no longer merely about the objects or the isolated perspective individuals have on those objects, but also about how the different perspectives are interrelated. This intersubjective dimension constitutes the basis for the best-known type of belief ascription, with adequacy conditions generally called de dicto, but which Fine sensibly calls strong or strict de dicto to distinguish them from their weaker counterpart (2009: 103). With the strong de dicto adequacy conditions, it is correct to ascribe to someone the belief that Superman is a superhero only if the subject actually believes that Superman is a superhero, and not if he or she believes instead that Kent is. Hence, for such a belief attribution to be correct, it has to be about the right objects, the conceptual pattern has to be respected and the right concepts have to be used. The semantic notion underlying strong de dicto adequacy is intersubjective coordination. A strongly de dicto correct belief ascription requires that the concepts used by the ascriber are intersubjectively coordinated with the concepts of the ascribee, which is to say that the belief ascription has to contain the same concepts as the belief that is ascribed. As a side note, the very name "de dicto" suggests an element of language use, which is generally interpreted as a requirement that the ascribee should be able to recognize, and thus assent, to a belief that is correctly ascribed to him. For this assent to be possible, the ascriber has to use the right words when expressing the belief ascription. On the proposed picture of linguistic competence, this means that the words used have to be conventionally associated with the correct mental representations, that is, the mental representations that are in fact constitutive of the ascribed belief. Evidently, the connection between the strong de dicto belief ascription and language use is accommodated by the semantic theory by the fact that intersubjective coordination is grounded in facts about communication.

The three dimensions of semantic theory have distinct theoretical roles as well. When a semantic theory is deployed within a broader theory of mind, the main role of the referential or objective dimension of semantic content is to make sense of an individual in his or her interaction with the environment. The subjective dimension, in contrast, is more about the cognitive aspect of an individual, as it focuses on the internal mental processes an individual goes through in his or her dealings with the environment. Finally, the intersubjective dimension is about the interaction between different individuals, in view of both the external environment they share and the internal mental processes they each have individually. The cognitive and the cooperative dimension of semantic content due to semantic coordination are in turn closely connected to the referential dimension through what Fine aptly calls a "web" of reference[21]. The fundamental role of semantic content as a whole is to capture the relation between linguistic expressions and extra-linguistic objects within a "web" of such expressions, be it within a unique mind or ultimately within a larger network of minds as manifested by the linguistic interaction that exists between them. Hence, a semantic theory is fundamentally about how linguistic symbols relate to objects, but it essentially

[20] For the sake of completeness, it should be mentioned that Fine has argued that there is a "requirement-based" approach to Semantic Relationism on which coordination does not have to be understood as a value of expression pairs (Fine 2010d). More is said about this in the final chapter on propositions, where it is argued that content should generally not be understood as an object to which an expression is related, but rather as a property of expressions.

[21] In personal conversation.

takes into account how these symbols are connected to each other in semantically relevant ways within or across individual minds. This entails, perhaps surprisingly, that these three dimensions are also essential for a theory of mental content, which is in fact what a semantic theory for the Language of Thought represents. It means that a theory of mental content is concerned not only with the entity a mental representation is about, but also with its broader role in cognition as well as with its communicative relation to the mental representations of others. In consequence, the three dimensions of semantic content are in play in all areas of research that draw on a notion of mental content, such as linguistics, psychology or cognitive science. Importantly, this remains true even if mental content plays only an implicit role, for instance in the assumption that thoughts can be shared across multiple individuals, which is based on the presupposition that different individuals can have token thoughts that share a same content.

6.4 Relationism vs. Referentialism

The aim in the next two sections is to revisit the examples used in the previous chapter to show how Semantic Relationism is an improvement over both Referentialism and Fregeanism, starting with Referentialism. The general advantage of Semantic Relationism over Fodor's Referentialism and his syntactic approach to Frege's Puzzle for the Language of Thought is that coordination is intersubjectively available to account for type-identity. Semantic Relationism offers a two-tier semantic theory with a level of content in addition to reference that only partly depends on the syntactic facts Fodor adduces to solve the type-identity problem. This partial dependence entails, on the one hand, that the proposal agrees with Fodor on the importance of syntactic facts regarding the type-identity of mental symbols. On the other hand, however, it also means that it allows for coordination that is not grounded in syntactic facts, which is available to solve the intersubjective variant of the Puzzle. The first example of this variant of the Puzzle involved a person called Anne who has a ORWELL concept and a second person called Bob with both an ORWELL and a BLAIR concept, and the problem for Fodor was to justify the claim that Anne's ORWELL tokens are type-identical with Bob's ORWELL tokens rather than with his BLAIR tokens. It was argued that neither reference, which Anne's ORWELL tokens share with Bob's ORWELL as well as his BLAIR tokens, nor the syntactic identity of the symbol used, which Anne's ORWELL tokens most likely share with neither Bob's ORWELL nor his BLAIR tokens, are up to the task. Unlike the Referentialist, the Relationist can claim that Anne's ORWELL tokens are type-identical with Bob's ORWELL tokens by virtue of being semantically coordinated with them. In contrast, there is no such coordination between Anne's ORWELL tokens and Bob's BLAIR tokens. This renders them type-distinct tokens even if they are factually co-referential. Accordingly, it is possible for the Relationist to properly distinguish thoughts about Orwell as Orwell from thoughts about Orwell as Blair. The Relationist can thereby justify claims such as that Anne and Bob share the belief that Orwell is a famous author. That way, the Relationist can also properly account for successful linguistic communication. In the basic case, an instance of linguistic communication is successful if and only if the linguistic interaction causes the hearer to have the same thought as the speaker, where two individuals count as having the same thought if each has a token of the same type of thought. The Relationist can similarly account for the role of beliefs in psychological laws. Beliefs are individuated by the content-bearing thoughts they contain, and since these are properly

individuated on a Relationist semantics, psychological generalizations will not be spuriously falsified because of beliefs that are based on co-referential but type-distinct thoughts. In the example of Bob, the assumed generalization that all people believe Orwell to be a famous author is no longer refuted by the fact that Bob believes that Blair is not a famous author.

The Relationist has no difficulty with the problematic case for an inferential or conceptual role semantic theory either. The example used against this approach involved two subjects who hear from a third party about a painter called Jackson and a painter called Pollock, both thinking that they are two distinct painters. Clearly, both subjects can have a conversation with each other about each one of the supposedly distinct painters, even if they know nothing about either of them other than that they are painters. The case is problematic for the proponent of an inferential role semantics because there is no differentiating belief to adequately distinguish JACKSON tokens from POLLOCK tokens. The Relationist, in contrast, has an answer to this problem. The fact that both JACKSON tokens are derived from the JACKSON token of the third party grounds a semantic fact that they are both coordinated with the token of the third party, which in turn means that they can count as type-identical with each other. There is also the additional fact that both subjects use their JACKSON tokens to interpret the use of the name "Jackson" by the other, which also grounds a coordination claim that directly supports a claim about the type-identity of the tokens in question[22]. The same evidently holds for the POLLOCK tokens as well. The difference between the Relationist and the inferential role based approach is simply that on the Relationist approach differentiating information about the bearer of the concept is not required for type-individuation. Since coordination does not depend on differentiating information, the Relationist has no problem with cases in which such information is not available.

The previous chapter also presented a case that is even worse for the proponent of an inferential role semantics. The case involved two subjects with diametrically opposed beliefs about what they think are two distinct objects, namely Phosphorus and Hesperus. The problem for the inferential role semantics is that since one subject believes about Phosphorus what the other believes about Hesperus, and vice versa, the concepts are incorrectly type-identified, which leads to the mistaken conclusion that the subjects in question have the same rather than diametrically opposed beliefs. As explained, an inferential role semantic theory makes it actually in principle impossible for subjects to have diametrically opposed beliefs. In stark contrast, such cases are not a concern for the Relationist, as type-identity is based in such cases on how the tokens PHOSPHORUS and HESPERUS are coordinated in virtue of their role in communication and not on the basis of what is believed about the objects to which the tokens refer. As a result, both PHOSPHORUS and HESPERUS tokens can be suitably type-identified, which in turn supports the obviously correct claim that the subjects in question have opposite beliefs about Phosphorus and Hesperus. Unlike the inferential role based proposal, Semantic Relationism generally allows for the possibility that people can have diametrically opposed beliefs about a given object. In sum, the Relationist approach properly takes into consideration that shared beliefs about an object are neither necessary nor sufficient for the type-identity of the concept tokens constitutive of those beliefs. That way, it is not threatened by the cases that undermine inferential role semantics.

[22] This is not to suggest, however, that facts about how concepts are derived cannot be in direct conflict with facts about how concepts are used in conversation, which can lead to contradictory assessments about type-identity. More about this issue later, but in the case described by Fodor there is no such conflict, as both types of fact support the claim that the JACKSON tokens and the POLLOCK tokens are coordinated and thus type-identical respectively.

For much the same reasons, the Relationist does not face the difficulties of the originalist proposal either. Without having to reconsider the specific examples used in the previous chapter, it is clear that a Relationist semantics allows for concepts with the same origin to be uncoordinated, and for concepts with a different origin to be coordinated. As in case of a concept's inferential role, the Relationist proposal takes into consideration that sameness of origin is neither necessary nor sufficient for coordination. Since type-identity is based on coordination, the proposal allows type-identical concepts to have a different origin, and type-distinct concepts to have the same origin, unlike the originalist alternative.

In all the problematic cases raised against the alternative proposals, coordination, and so type-identity, is based specifically on facts about how concept tokens are derived through linguistic interaction. It is important to realize, however, that being derived from each other is not a necessary condition for concept tokens to be coordinated, if else the Relationist proposal will be vulnerable to similar counter-arguments as the originalist view. As explained, it is possible for concept tokens to be coordinated even if neither token is directly derived from the other. In such cases, the Relationist will maintain that the subsequent pattern of communication grounds semantic coordination facts, which in turn provide the basis for claims about the type-identity of concept tokens. Keeping in mind the explanatory modesty of the proposal, the basic idea is that a judgment to the effect that some instance of linguistic communication is successful motivates a judgment that the concepts involved are semantically coordinated, and thus type-identical as well. Importantly, the modest explanatory approach does not compromise the metaphysical claim that coordination accounts for type-identity and hence for the success of linguistic communication as well.

Generally speaking, the reason Semantic Relationism is able to offer a semantic solution to cases that are problematic for the alternative Referentialist proposals is that it is not committed to any one specific underlying cause for the coordination between tokens. This enables the necessary flexibility to posit coordination as required on a case by case basis. An obvious drawback of this approach, it may seem, is that it thereby no longer provides a substantial, unified and explanatory account of why token concepts are coordinated in each case. As a result, the proposal may appear explanatorily less valuable than its alternatives, perhaps even to the extent of being vacuous. However, in reality this concession only means that semantic facts about coordination are independent facts, which are independent of, and thus not reducible to, such non-semantic facts as, say, what conceptual role a concept has or what its origin is. Moreover, as explained, the view is not that coordination facts cannot be explained by non-semantic facts at all, the main idea is rather that facts about coordination have to be explained by different non-semantic facts on a case by case basis. It is also crucial to realize that one cannot appeal to the explanatory potential of the alternative proposals to object to the current proposal given that the alternatives are in fact refutable. This is true in particular if there are good reasons to think that they fail precisely because they over-commit in terms of the explanations they provide, which is apprently the case with the alternative Referentialist suggestions.

The most important conclusion of this section is that in contrast to Fodor's Referentialism, Semantic Relationism provides a notion of content substantive enough to solve even the intersubjective variants of Frege's Puzzle for the Language of Thought. In addition, Semantic Relationism also provides the necessary flexibility to handle the different versions of the intersubjective Puzzle, mainly because it does not assume a specific obligation to any one underlying cause for coordination,

in contrast to the various augmented Referentialist proposals considered in the previous chapter. Importantly, however, this does not mean that the proposal entails that semantic facts about coordination cannot be further explained by non-semantic facts. The proposal only rejects the idea that the same type of non-semantic fact can ground coordination in all cases, but it does not reject the claim that in all cases of coordination, there is some non-semantic fact that grounds it. This explanatory approach is weaker than what the alternatives propose, but it is therefore not inferior for the simple reason that the stronger explanations offered by the alternative theories are either incomplete or false. In conclusion, Semantic Relationism is preferable over Referentialism as a theory of content for the Language of Thought in view of Frege's Puzzle.

6.5 Relationism vs. Fregeanism

6.5.1 Solving Kripke's Variant

The most important distinction between a Fregean and a Relationist semantics lies in the non-transitivity of coordination as opposed to sense-identity. Whereas coordination is transitive only in specific circumstances, for instance when grounded in a transitive relation such as syntactic symbol identity, sameness of sense is necessarily and universally a transitive relation. The problem for the Fregean is that Kripke's variant of Frege's Puzzle for the Language of Thought shows, in Fine's words, that an adequate theory:

> "need[s] a notion of "same-saying" or of "reproducing content" that can fail to be transitive. This is something that the Relationist can provide in his notion of strictly co-referring or saying the same when the relata between which the relation holds may to some extent be opaque. But it is a mystery what the Fregean might put in its place. If coordination is a matter of having a common sense or "guise" then it must be transitive"
> (Fine 2009: 119)

The main example used against Fregeanism in the previous chapter involves a case with a teacher T and two students, called B for believer and D for disbeliever respectively. The problem for Fregeanism is the joint inconsistency of the following four claims:

(4) T's Paul concept has the same sense as B's first Paul concept.

(5) T's Paul concept has the same sense as D's Paul concept.

(6) D's Paul concept has the same sense as B's second Paul concept.

(7) B's first Paul concept does not have the same sense as B's second Paul concept.

The inconsistency is due to the fact that by the transitivity of sense-identity, (4), (5) and (6) together imply the opposite of (7). Yet problematically for the Fregean, none of the claims can reasonably be rejected, as it leads to unacceptable consequences. Rejecting (7), for instance, makes B irrational, as he would then believe about what is obviously the same person for him that he both is and is not musical. This is highly implausible, though, given the description of the case.

After all, B merely fails to recognize a person as the same on two different occasions, which puts him in the same position as an Ancient Greek who fails to realize that Phosphorus is Hesperus. By Fregeans' own standard, B thereby makes a factual and not a logical mistake. The alternative for the Fregean is to reject at least one of (4), (5) or (6). Either way, this means that the Fregean is forced to classify at least one apparently successful instance of linguistic communication as a misunderstanding. The reason is that on the Fregean approach, successful communication consists in the transmission of thoughts that express the same sense. In Fregean terminology, the hearer and the speaker each need to have a syntactically structured mental representation that expresses the same Fregean thought. It follows that if the two concept tokens that underlie the use of the proper name "Paul" are sense-distinct, the bearers are not speaking about the same person in the way required by the semantic theory. They are evidently still speaking about the same person insofar as the concept tokens remain co-referential, but only in the sense that speaking about Phosphorus is speaking about the same object as speaking about Hesperus. Factual co-reference, however, is not generally sufficient for an instance of linguistic communication to count as successful on the Fregean approach. The major problem for the Fregean then is that it is not plausible to maintain that there is a misunderstanding between B, D and T in the case described.

As a result, there is no plausible way for the Fregean to uphold the transitivity that is necessarily built into the theory of senses. As mentioned, the best defense a Fregean can offer at this point is to maintain that the theory, while imperfect, remains the best option available in view of the failure of the Referentialist alternative. This prima facie reasonable defense is no longer tenable in view of the Relationist alternative, however. Semantic Relationism offers a straightforward solution to the case, as the corresponding claims are not jointly inconsistent on a Relationist semantics:

(8) T's Paul concept is coordinated with B's first Paul concept.

(9) T's Paul concept is coordinated with D's Paul concept.

(10) D's Paul concept is coordinated with B's second Paul concept.

(11) B's first Paul concept is not coordinated with B's second Paul concept.

Semantic Relationism allows for the joint truth of these claims, which together provide the correct semantic description of the case. With Semantic Relationism, it is possible to maintain that no participant commits a logical mistake in being irrational, as would be entailed by the rejection of (11). At the same time, it is also possible to maintain that there is no instance of misunderstanding or miscommunication in the interaction between the different participants, as would be entailed by the rejection of either (8), (9) or (10). Instead, on the Relationist description of the case, B merely fails to recognize Paul as the same on the second occasion, which means that B makes a mistake that is similar to the factual mistake the Ancient Greeks make when they fail to recognize that Phosphorus is identical with Hesperus. This is captured by the fact that in both cases the subjects in question have co-referential but uncoordinated concepts. The Fregean, in stark contrast, can only defend this idea at the expense of a plausible theory of linguistic communication. This suggests that the Relationist can offer a description of the case that Fregeans would presumably endorse as well, but which they cannot because of the inbuilt transitivity of the sense-identity relation.

As Fine explains in the quote, semantically faultless transitivity failures can occur as it is possible that a relevant coordination pattern is not entirely within the epistemic purview of a linguistic agent. In such a case, there can be no semantic requirement on the subject to coordinate a later use of a proper name with a previous use, and hence it cannot count as a linguistic mistake if the subject uses distinct mental symbols to interpret two distinct uses of the same proper name. To highlight this point, it can be imagined that the initial conversation between the teacher and the students is divided into two distinct conversations between the teacher and one of the students each, without the participation of the other. In that case, it is manifestly impossible for B to be aware of the relevant coordination pattern, and hence he cannot be semantically blamed for disrupting it. The lack of epistemic access thus explains why the case involves no semantic mistake on B's part, but is characterized instead by a semantically innocuous misidentification of an object, akin to Frege's example of the Ancient Greek's beliefs about Hesperus and Phosphorus. However, only Semantic Relationism allows for a consistent description of these semantic facts. Fregeanism, in contrast, can provide either a complete or a consistent description of the facts, but not both. That way, Kripke's variants of Frege's Puzzle reveal the limitations of a Fregean sense theory to provide a consistent and complete description of the totality of semantic facts.

At this point, it is only fair to highlight an analogous difficulty with the current proposal, which is due to the claim that coordination is a necessary and sufficient condition for type-identity. This is problematic because unlike coordination, type-identity is necessarily a transitive relation, which entails that while the semantic account the proposal offers for cases with transitivity failures is both consistent and complete, the corresponding account on the level of types is not. In the specific example described, the following claims are jointly inconsistent:

(12) T's Paul concept is type-identical with B's first Paul concept.

(13) T's Paul concept is type-identical with D's Paul concept.

(14) D's Paul concept is type-identical with B's second Paul concept.

(15) B's first Paul concept is not type-identical with B's second Paul concept.

It is clear that a theorist cannot maintain the four claims at the same time. Evidently, the problem for types is the same as for senses, and it affects types for exactly the same reason, which is that it makes use of an identity relation that is necessarily transitive. As a result, the outcome is the same as for Fregeanism. In cases of semantically faultless transitivity failures, a type-based description gives either a complete or a consistent description of the semantic facts, but not both. The obvious question this raises is whether this problem undermines the very idea of basing type-identity on the relation of semantic coordination.

To begin with, it is important to emphasize that the difficulty is a problem within the theory of types and not within the theory of content. A Relationist Semantics provides the necessary tools to fully and consistently describe the facts about the content of mental symbol tokens in cases of semantically faultless transitivity failures. So the transitivity problem arises for the type-identification of tokens on the basis of their semantic content, and not for the assignment of that content to mental symbol tokens in the first place. More specifically, it arises because of a mismatch between the basic principles underlying a theory of mental representation types and the unaccommodating

semantic reality to which it is applied. Hence, the difficulty can not be used by a proponent of an alternative semantic theory to dismiss a Relationist semantics. It has no bearing on which semantic theory adequately describes the content of the Language of Thought. In addition, the mismatch is only partial. In reality, most cases will very likely not involve semantically faultless transitivity failures, either because there is no failure of transitivity or because it is not faultless, and hence they will not give rise to the mismatch problem.

What is the right conclusion to draw from possible inconsistencies on the level of types, then? The most important question it raises presumably concerns the reality of types, and specifically whether one should adopt a Nominalist or a Platonist attitude towards their existence[23]. The fundamental issue is whether abstract mental representation types exist as real objects in addition to their concrete mental symbol tokens. Arguably, a plausible response to the inconsistencies is to maintain that they point to a Nominalist or instrumentalist conception of types. On the Nominalist approach, abstract types are nothing more than human constructions that are scientifically useful to describe empirical reality without being actually real. If that is correct, the possible inconsistencies only show that types are scientific tools that are not perfectly suited for their task, which is to provide an abstract description of the mental facts that are constitutive of empirical reality. Fine offers a useful analogy with the biological notion of a species in this regard[24]. A species is generally defined as a group of organisms that are in principle capable of interbreeding. Clearly, transitivity failures are also possible in the case of interbreeding, for instance if an organism A can produce offspring with B, and an organism B with C, but A not with C. In that case, a species-based description of the biological reality is similarly either inconsistent or incomplete. The most plausible response to this problem in the biological case is presumably to maintain that a species is in fact not a biologically real category, but is rather a man-made category that describes, in a helpful if at times inexact way, the more complex biological reality. The analogous approach in the semantic case is the view that abstract concept, thought and belief types are not real entities, but rather useful if at times imperfect tools to provide an abstract description of the more complex semantic and mental reality, and specifically the facts about the coordination relations that hold between mental representation tokens.

The drawback of this approach is that other considerations appear to speak in favor of a more Platonic conception of abstract concept and thought types. The idea that concepts are mental representations has, for instance, been attacked by Peacocke on the grounds that there are thoughts, and hence concepts, that have never been entertained by anyone (2005: 169). Peacocke reasons that a thought such as that five is bigger than three is true even if it had never been entertained, as evidenced by the fact that it was evidently true even before the existence of thinking beings. The truth of such thoughts requires that they exist even if they are not mentally represented, which according to Peacocke shows that thoughts cannot be mental representations. The correct reply to this argument, provided by Laurence and Margolis, is that Peacocke is mistaken as he ignores the type/token distinction that holds for thoughts and concepts if they are mental representations (Margolis and Laurence 2008). Laurence and Margolis argue that thoughts that have never been entertained are in fact mental representation types without tokens. To say that a thought is not mentally represented is thus to say that the abstract thought has no concrete mental tokens. Accordingly, it is possible to maintain that the thought type that five is bigger than three is true

[23] See Wetzel (2009, 2011) for a detailed discussion of this question.
[24] Personal conversation.

even if it has no tokens. This, however, seems to require that types exist independently of being tokened, which clearly suggests a Platonic conception of types. The fact that thoughts can be true without having tokens indicates that they can exist independently of their tokens. As a result, there is an evident conflict between the considerations that speak in favor of a Nominalist conception of concepts and thoughts as types and those that speak in favor of a more Platonic approach instead.

Admittedly, the current view has no decisive proposal to resolve this conflict. It is worth repeating, however, that the problem does not affect the Relationist semantics endorsed for the Language of Thought. The fundamental problem is rather the mismatch between the conflicting demands semantic reality makes on an adequate semantic theory on the one hand, and the underlying principles of a theory of types on the other. Therefore, the problem does not speak in favor of any of the alternative semantic proposal considered in this thesis. If anything, they avoid the mismatch problem only because they provide an incomplete description of the semantic facts to begin with. On the Fregean approach, for instance, there will be no mismatch between the theory of senses and the theory of types as the difficulty that transitivity failures raise for the theory of types is raised in exactly the same way for the theory of senses as well. There is thus not mismatch as the theory of senses is problematic in exactly the same way as the theory of types. The fact that Fregeanism avoids the mismatch problem in this way is therefore not an advantage of the theory.

Alternatively, it is tempting to think that the mismatch problem shows that type-identity cannot be based on semantic content at all. A possible conclusion is then to give up the idea that the type-identity of mental representation tokens is based on the fact that they have the same semantic content. However, it is important to note that whatever type-identity is ultimately based on, it is clear that it is not possible to provide a consistent and complete type-level description of the cases in which transitivity failures occurs. Hence, cases of faultlessness transitivity failures remain problematic for the theory of types on the reasonable assumption that syntactically distinct thought tokens are type-distinct and that successful linguistic communication involves the sharing of type-identical thought tokens. This shows that the problem exists independently of the claim that type-identity is based on the identity of semantic content. Another option is to abandon types altogether, which is rather radical, however, given the usefulness of the notion for most cases that are actually unproblematic. The third and arguably preferable option is to take cases of semantically faultless transitivity failures to represent limiting cases for the theory of types rather than refutations of it. The basic idea is to think of the theory of types as providing an idealized description of reality, in which the notion of a mental representation type serves as a useful proxy for a manifold of mental representation tokens that abstracts from the complex semantic reality in terms of the coordination relations these tokens stand in. The claim that two mental representation tokens are of the same type then amounts to the claim that the tokens are either directly coordinated or linked together in a coordination chain through other tokens in an idealized way, that is, on the assumption that there are no undermining facts due to cases of faultless transitivity failures.

On the proposed view, the theory of types represents an idealization in an abstractive as well as in a normative sense. In the abstractive sense, types are the abstract representatives of a manifold of mental representation tokens, which is idealized in that it abstracts from the unaccommodating semantic reality if necessary. That way, the theory of types faithfully takes semantic reality into account to the greatest extent possible, which is up to the limiting case when it has to ignore, or to arbitrary settle, instances of faultless transitivity failures. The normative sense of idealization,

in turn, is due to the fact that the abstraction has normative import by suggesting how communication should ideally be. In the example with the teacher and the two students, there is clearly something amiss from a semantic point of view. There is evidently something irrational about the totality of beliefs held by the entire group. Arguably, it is semantically faultless only because the epistemic outcome is neither due to the irrationality of one of the group members, nor to a case of miscommunication between them. Even so, there is something semantically problematic about the resulting beliefs, which are jointly irrational, as shown by the fact that if the beliefs were held by a unique person instead of a group, the person would count as irrational. This suggests that the root problem is a mismatch between the fact that semantic norms are directed essentially at individuals, while the epistemic irrationality results from the collective behavior of the group for which none of the group members is individually blameworthy. In that sense, types as abstractions are idealizations in the normative sense that they prescribe semantically ideal coordination patterns for their tokens.

For the sake of completeness, it is worth noting that this fundamental issue has already been raised in the literature. In his initial paper, Kripke already stresses the unpalatable consequences that result from faultless transitivity failures. Kripke points out that because of them, the theories of belief and content:

> "[...] are subjected to the greatest possible strain, perhaps to the point of breakdown. So is the notion of the content of someone's assertion, the proposition it expresses." (Kripke 1979: 269)

Kripke's focus is different, but the underlying problem is the same. Faultless transitivity failures create the same fundamental difficulty for all views that make use of an identity relation, whether it is the notion of having the same belief or the same thought, or of thoughts having the same content, or the notion that beliefs and assertions express the same proposition, or indeed that they are tokens of the same type. This clearly shows how general the problem is, and how little it depends on the specific commitments made so far. Not surprisingly, Fine argues that his deliberations corroborate Kripke's pessimistic conclusion (2009: 121). It is interesting to note, then, that neither Kripke nor Fine propose a solution to this problem for the notion of interest to them that could be appropriated for the theory of types, given the analogous nature of the difficulty. This indicates that a proper solution to this fundamental problem, as required to settle the issue about the existence of types, remains elusive at this point. To the extent that the thesis is thus unable to provide a definitive solution to this problem, it is at least in good company.

6.5.2 Solving the Privileged Access Problem

A further problem raised for Fregeanism in the previous chapter is to motivate the privileged cognitive access that Fregeans assume cognitive agents have to senses. As explained, privileged access to senses is necessary if else they cannot be taken to solve the mode of presentation problem for the reason that they would themselves be affected by the problem they are supposed to solve. Positing senses to solve the mode of presentation problem for reference would require another level of senses to solve the same problem for senses, and so ad infinitum, so that the Fregean explanatory strategy never gets off the ground. In contrast to the Fregean, the Relationist does not face this difficulty. The reason is that intrasubjective coordination is a mental relation that holds between

directly accessible mental symbols, because of which it is plausible and uncontroversial to assume that cognitive agents can have direct and infallible cognitive access to it. More precisely, the mind can reasonably be presumed to have direct access to coordination relations via their functional dependence on the directly accessible syntactic properties of the symbols contained in the mind. Put simply, the computational mind only has to check whether two symbols are syntactically identical to ascertain whether they are positively or negatively coordinated. So unlike in the case of sense-identity, it is not at all problematic to explain how and why the mind can have direct and infallible access to intersubjective coordination relations.

Prima facie, it thus appears that Relationism fares better than standard Fregeanism, which is premised on the questionable idea that minds have infallible cognitive access to senses that are mind-external objects. More interesting, however, is the comparison with a Fregean who also claims that sense-identity is directly cognitively accessible via the syntactic identity of the mental symbols. Such a Fregean would suppose that at least in some cases, namely intrasubjective cases, sameness of syntactic symbol coincides with sameness of sense, while at the same agreeing with the Relationist that because of the multiple realizability of content, this is not so in intersubjective cases. Even then, the Relationist semantics has an advantage over its Fregean counterpart, however, even if the advantage is somewhat harder to explain. The crucial difference is that only a Relationist semantics can make it obvious, in a principled way, why there should be a difference between the intrasubjective and the intersubjective case in terms of how the second level of content, be it coordination or sense-identity, depends on the syntactic properties of the content bearers. The reason is that on the Fregean approach, the intrasubjective and the intersubjective cases are exactly parallel. Both cases involve a relation of "expressing" between two individual mental symbol tokens and an extra-mental entity, namely their sense, and a further relation between the senses expressed, either a relation of identity or non-identity, depending on whether the two mental symbols are sense-identical or not. Hence, on a Fregean sense theory, there is no principled theoretical difference between the intrasubjective and the intersubjective case.

On the Relationist picture, in contrast, it is clear that the coordination relation in the intrasubjective case has a different status from the coordination relation in the intersubjective case. In the intrasubjective case, the coordination relation can itself be taken to be intrasubjective, unlike in the intersubjective case, where the relation is not part of any one mind. In other words, coordination is plausibly a mental relation in the intrasubjective case, but an extra-mental relation in the intersubjective case. This systematic difference between the intrasubjective and the intersubjective case differentiates the Relationist notion of coordination from the Fregean notion of sense-identity, which is an extra-mental relation in both cases.

To clarify this issue, the basic problem is that the Fregean cannot explain, in a principled way, why there should be a systematic difference between both cases in terms of how sense-identity depends on syntactic identity. On a Fregean sense theory, both cases are necessarily parallel. The composite relation, which is constituted by two instances of the "expressing" relation and one instance of an identity or non-identity relation, is the same in each case. Hence, from a Fregean point of view, the principled difference is unexpected, which means that a Fregean cannot properly motivate the claim that sense-identity depends on syntactic symbol identity in the intrasubjective case but not in the intersubjective case. As a result, the Fregean can avoid the unwarranted claim of direct cognitive access only by substituting it for another claim that is equally unwarranted. The reason for this is

ultimately an unintended side effect of Fregeanism. Because of the interposition of a sense entity, the fact whether two mental tokens belong to the same mind or not becomes semantically irrelevant, with the consequence that the intrasubjective and the intersubjective case become parallel from the point of view of a semantic theory. Due to the semantically indirect route via mind-external sense entities, there is no systematic difference between the intrasubjective and the intersubjective case, which is why the Fregean has no proper motivation for the claim that sense-identity is based differently on syntactic identity depending on the type of coordination. To be clear, this is not to deny that Fregeanism is consistent with the fact that there is such a difference. The point is merely that unlike Relationism, it does nothing to explain it. Hence, the fact that Semantic Relationism can make sense of this systematic difference clearly speaks in favor of its relational conception of the second level of semantic content, which is such that it relates mental symbols directly and not via a mind-external abstract entity. This difference is admittedly subtle, but theoretically telling nonetheless. Moreover, it is worth keeping in mind that even if Fregeanism can be amended with a syntactic response to counter the worry about cognitive access, it is still unable to address the problem highlighted by Kripke's variant of Frege's Puzzle for the Language of Thought.

Another worry raised for Fregeanism in the previous chapter is Fodor's doubt about the ontological nature of senses in view of a naturalistic worldview. Evidently, Semantic Relationism avoids this specific worry, as the theory makes do without senses as abstract entities expressed by linguistic expressions. It is just as clear, however, that the Relationist faces the same kind of worry concerning the ontological status of its second-tier of semantic content. Any doubt about the ontology of senses extends to the ontology of coordination. As mentioned, the best defense a Fregean can offer in favor of positing senses is that they are theoretically indispensable. Unfortunately, this Fregean defense is undermined by Semantic Relationism. If coordination relations are able to explain the relevant semantic facts, senses are shown to be no longer theoretically required. However, the Relationist can avail himself of that very response. Given that no other semantic theory can successfully address all the variants of Frege's Puzzle for the Language of Thought, especially Kripke's variants, coordination relations are shown to be theoretically necessary, which in turn justifies the assumption that they are part of empirical reality. Moreover, it was pointed out that a Relationist semantic theory is in fact compatible with naturalism. The crucial assumption is that semantic facts about coordination are fundamental facts of nature. The underlying motivation is that it is preferable to extend the realm of the natural to encompass the semantic entities that are proven to be explanatorily indispensable rather than to curtail the semantic theory of notions necessary to provide an adequate description of empirical phenomena such cognition and communication. So with an extended conception of the natural, it is in fact possible to combine a Relationist semantics with a naturalistic worldview.

6.6 Consequences of Relationism

6.6.1 Animal Concept Possession

The main aim in this section is to point out some consequences that result from a Relationist approach to semantic content for topics beyond Frege's Puzzle and the type-identity of Language of Thought symbol tokens. The focus is on two topics, animal cognition and Twin Cases, but these

topics are exemplary for the broader philosophical import of a Relationist semantic theory, which serves to highlight its potential for achieving progress in research areas beyond the core subject of the thesis. The objective in this section is therefore not to provide a comprehensive discussion on the extensive topics of animal cognition and Twin Cases. Rather, the much more modest goal is to illustrate, on the basis of two concrete examples, some interesting consequences of Semantic Relationism, which at this point has already been established as the only adequate semantic theory to serve as a theory of mental content in the case of human minds.

The first example is the debate about the cognitive capacities of non-human animals. A major issue in current research is whether non-human animals possess concepts that are similar to the concepts of humans. In view of the theory of concepts endorsed for humans so far, the question is whether non-human animals have mental representations with syntactic and semantic properties that are comparable to the mental representation of humans, the only animal endowed with substantial linguistic capacities[25]. Not surprisingly, two main positions are advocated in the literature. The first faction defends what can be called a continuity hypothesis regarding the conceptual capacities of animals and humans. On this view, the possession of mental representations with syntactic and semantic properties is a shared characteristic of both humans and (some) animals. The opposing side advocates a discontinuity hypothesis instead. They argue that human concepts are fundamentally different from the mental representations possessed by animals. In the literature, this issue is mostly debated as the question whether animals have beliefs in the same way that humans do. The connection between concept possession and belief is obvious enough. In the debate on animal concepts, it is generally accepted that concepts are the constituents of thought, which in turn are the content-bearing constituents of propositional attitudes such as belief. Hence, in order to have beliefs like humans, animals need to have concepts like humans as well[26].

What, however, is the basic motivation for either view about animal concept possession, and how does it relate to the Language of Thought hypothesis? Proponents of the continuity hypothesis consider the conjecture that animals possess concepts a fundamental element of the broader empirical research into the higher-order cognitive capacities of animals (Gallistel and King 2009: xiv-xv). According to them, the hypothesis has both theoretical and empirical plausibility. In contrast, the opponents of the view consider the continuity hypothesis a manifestation of a mistaken form of anthropomorphism. This negative attitude is almost universally motivated by the view that conceptual capacities are closely related to linguistic capacities, which only humans have to a substantial degree. In the philosophical literature, Davidson is best-known for the view that language is necessary for thought, by which Davidson means that competence in a natural language is a necessary condition for higher cognitive capacities that deserve to be called thinking (Davidson 1982). The view that a natural language is necessary for thought is rejected by most proponents of the Language of Thought hypothesis, however. The main reason is that most Language of Thought theorists think that thought is necessary for competence in a natural language but not vice versa. For them, having thoughts is metaphysically independent of being competent in a natural language, while competence in natural language depends metaphysically on the ability to think, as implied by the view that linguistic competence consists in the ability to translate natural language strings into thought (Fodor 1998: 96). Proponents of the Language of Thought hypothesis therefore often

[25] From here on, the term "animal" is used as a short form of "non-human animal".

[26] The debate is of course about concepts that animals can plausibly have, such as for food, danger or siblings, and not for atoms or democracy.

endorse the view that (some) animals also have thoughts as understood on a Language of Thought based approach to cognition, even if they are of course not theoretically compelled to do so.

In view of semantic theory, the fundamental question then is whether animals have mental states with the same kind of mental content as humans. Since the assumption is that the mental content of humans is correctly described by a Relationist semantics, and that a semantic theory is a theory of content only for mental entities with syntactic properties, it follows that a crucial initial question is whether at least some animals have mental representations that are symbols in a Language of Thought. Answering this in the affirmative, Gallistel and King maintain that animals have access to "symbolically represented information" that can be "constructed by computation", which is:

> "very generally the story about what goes on in the brain, the story of what it is about the brain's activity that enables animals to behave effectively in the experienced world."
> (Gallistel and King 2009: 59)

As in the case of humans, Gallistel and King's argument in favor of animal concepts is based on theoretical considerations regarding the resources necessary to account for complex behavior. More precisely, it is based on the computational resources required to explain the cognitive capacities that need to be posited in order to account for the complex behavior that animals are observed to display (Gallistel and King 2009: 99). An important example for Gallistel and King in this context is dead reckoning:

> "a computational process that is universally agreed to play a fundamental role in animal navigation."
> (Gallistel and King 2009: xiv)

If one accepts Gallistel and King's conjecture that animal minds perform computations in a symbolic medium, an important follow-up question is whether the mental symbols of animals are similar enough to the mental symbols of humans to deserve being called concepts.

However, many theorists in fact question whether it is acceptable to ascribe a Language of Thought to animals. The main point of contention is whether animal thinking is sufficiently systematic to make a Language of Thought based approach plausible. After all, explaining the systematicity of human thought is a major motivation for the Language of Thought hypothesis in the case of human minds. In what follows, this issue is considered in depth, for two reasons. First, because of its pivotal status in the literature on animal concept possession, and secondly, because it is also crucial to properly understand the nature of Language of Thought hypothesis as applied to human minds. In the philosophical literature, the systematicity of thought is generally discussed in terms of Evan's generality constraint (Carruthers 2009). This is only a terminological difference, however, without theoretical significance. Carruthers, for instance, argues that the generality constraint is essential for genuine thinking:

> "The generality constraint is believed to be warranted by the demand that real thoughts must be compositionally structured. [...] [I]n order to count as a genuine thinker, a creature's thoughts must be composed out of recombinable conceptual components."
> (Carruthers 2009: 95)

On this widely adopted view, the generality constraint represents the fundamental hallmark of genuine thought. Many philosophers in fact believe that the cognitive processes of animals fall

short of the generality constraint, and so do not qualify as genuine thought. Carruthers, however, points out that for a start, one has to distinguish between a weak and strong reading of the constraint. The difference is:

> "between a strong requirement that genuine concepts must be recombinable with all (or almost all) syntactically permissible others, and the weaker requirement that genuine concepts must be recombinable with at least some others."
> (Carruthers 2009: 95)

The weak constraint basically demands combinability as a general possibility, whereas the stronger constraint requires combinability as a universal necessity. Carruthers subsequently argues that animals satisfy only the weaker version of the generality constraint (2009: 98). This provides philosophers such as Davidson with the means to defend the discontinuity hypothesis based on the idea that the strong version alone is sufficient as a threshold for genuine conceptual thought. Carruthers, however, rejects this argument, as he thinks that even humans only meet the weak version of the constraint:

> "Crucially, compositionality does not warrant the strong generality constraint, which is the one that creates problems for the idea that any non-human animals are genuine concept users."
> (Carruthers 2009: 97)

Hence, Carruthers defends the continuity hypothesis on the basis of the claim that the Language of Thought of humans is not actually as systematic as is commonly assumed. The motivation for this claim is that humans:

> "can't actually interpret or do anything with such thoughts as Julius Caesar is a prime number or Green ideas sleep furiously."
> (Carruthers 2009: 98)

Carruthers' basic point is that thoughts such as the thought that Julius Caesar is a prime number are not interpretable by human thinkers, which entails that the concept for Julius Caesar does not semantically compose with the concept of being a prime number as required by the stronger version of the generality constraint. Hence, Carruthers claims that compositionality, and thus systematicity, is limited in the human case as well. Humans only meet the weak version of the constraint. The weak version therefore has to suffice as a criterion for genuine thought, if else humans fail to qualify as genuine thinkers, too. As it is plausible according to Carruthers to assume that animals meet this requirement as well, the argument lends support to the continuity hypothesis.

As explained already, however, Carruthers' rejection of the strong version of the generality constraint is based on a confusion between what it takes to entertain a thought and what it takes to have a sense of what the world would have to be like for the thought to be true. Systematicity as a characteristic of thought is fundamentally about intellectual and not imaginative power. Carruthers is evidently right that it is rather hard for humans to imagine what the world would have to be like for Caesar to be a number or for green ideas to sleep. However, this does not mean that humans are incapable of entertaining such thoughts. In contrast, it is in fact rather plausible to assume that humans are able to entertain even very abstruse thoughts. How could humans otherwise know that the thought that green ideas sleep is not true, if only because they know that ideas are not among

the green things nor the sleeping things? Pace Carruthers, this indicates that humans are able to entertain the thought that green ideas sleep, if otherwise they could not know that it is not true. An analogous case makes this point obvious. By Carruthers' reasoning, human thinkers would not be able to know that the thought that a given object is not self-identical is false either, as they would be unable to entertain that thought by virtue of the fact that they cannot make sense of a world in which objects are not self-identical. It is evident, however, that humans can, and leaving philosophical concerns aside, in fact do know that all things are self-identical, which means that they also know that the opposite is not true, even if they cannot imagine a world in which it is. Hence, contrary to what Carruthers claims, it is plausible to assume that humans meet the strong version of the generality constraint. It is important, however, not to confuse a constraint on the systematicity of the mental operation of entertaining a thought with a constraint on the distinct mental operation of imagining worlds in which the thoughts are true, as Carruthers does.

As a result, Carruthers' argument for the continuity hypothesis fails. Even so, his support of the continuity hypothesis is arguably still appropriate, for the reason that the implications of systematicity for the question about animal concept possession are rather minimal. In fact, the main reason that the strong version of the generality constraint is required for humans is to account for their linguistic capacities. Humans need the capacity to entertain thoughts such as that Caesar is a prime number primarily because their linguistic competence requires them to understand sentences such as "Caesar is a prime number". Hence, human thought needs to be strongly systematic only because natural language is, and because thought underlies linguistic competence by virtue of providing the necessary interpretations for natural language strings. Given that animals do not have linguistic competence, there is no corresponding theoretical pressure to require the strong systematicity for animals. It is therefore not much of a problem if one posits only the weaker version of the generality constraint for the animal Language of Thought[27]. So instead of defending the continuity hypothesis on the basis that humans only display weak systematicity in thought, as Carruthers does, it is preferable to defend the continuity hypothesis by pointing out that while only humans meet the stronger constraint, only humans are in fact required to do so. In other words, it is possible to defend a Language of Thought based approach for animal cognition while accepting that humans and animals display varying levels of systematicity in thought.

Presumably, Carruthers dislikes this approach as it allows the proponents of the discontinuity hypothesis to maintain that animals do not have concepts based on the claim that only mental representations that are strongly systematic qualify as concepts. An initial observation to make in this regard, however, is that a debate merely about what to call "concept" is only terminological and by itself without scientific merit. The real question then, which remains open at this point, is whether animal concepts, assuming there is terminological agreement that the term is appropriate, have exactly the same content as human concepts. So far, the argument has been that it is at least plausible to assume that the mental symbols of animals have similar syntactic properties as human mental symbols, even if these symbols are used less productively by animal minds, and so the natural question is whether the same is true for their semantic properties as well. Do animal

[27] Fodor of course holds that systematicity is a necessary feature of human thought, to account for which positing a compositional Language of Thought is sufficient. That does not entail, however, that it is not possible to have a Language of Thought and yet display cognitive behavior that suggests less than full systematicity, since it is possible that animals, perhaps because of their lack of linguistic competence, do not make full use of the conceptual capacities that their Language of Thought in fact provides. The fundamental difference between humans and animals lies then not in the means available for systematic thought, but rather in how these means are put to use.

concepts have the same content as human concepts? And if not, to what extent they do share a content? And if they do not share a content at all, what motivates this claim?

As indicated, the question about the content of animal concepts is widely discussed in the literature as a question about what animals can and cannot belief in comparison to humans. The main question is what content can reasonably be ascribed to the propositional attitudes of animals that lack the sophisticated linguistic capacities possessed by humans. A very intuitive, and accordingly prevalent, view is that it only makes sense to ascribe beliefs of the de re variety to animals, as de dicto belief attributions are based on distinctions in content that are too fine-grained for the beliefs of animals. The view is thus that animals can be attributed beliefs about specific objects, but that it is not possible to make more fine-grained distinctions between the content of beliefs about the same object, as is possible in the human case. To given a concrete example, it can for instance be warranted to ascribe a belief about Venus to a dog howling at the heavenly body visible in the evening, but it makes no sense to make a more fine-grained determination, for instance by saying that the belief is about Venus "as Hesperus" and not about Venus "as Phosphorus". This contrasts with humans, where it it is possible to determine whether a given belief about Venus is about the planet "as Hesperus" or "as Phosphorus". The most common way to determine this in the human case is evidently by asking the person in question. This is not to suggest that such a determination is always possible, however, be it because of an unbridgeable geographical or temporal distance or because the believer speaks an unknown language, but the point is that it remains universally possible in principle. As the name already suggests, "de dicto" belief attributions are thus naturally taken to involve an element of potential assent on the part of the ascribee of the belief, which in turn presupposes linguistic capacities that animals do not possess. On the proposed view, animal belief attribution is thus restricted to the observable target of animal cognition, which is the object the belief is about and the object at which the resulting behavior is directed. Therefore, de re belief attributions are the best that a theorist can hope for in the case of animals on this view.

Given the role of content for typing mental representation tokens, this suggests that on the majority view, animal beliefs, and so thoughts as well as concepts, can be typed only by what they are about. They can be typed only by their reference and not in a semantically more fine-grained way. On a realist view of semantic content, this means that the content of animal concepts is referential. Accordingly, a Fregean will conclude that animal concepts have a reference but fail to express a sense, which would allow for a more fine-grained distinction between co-referential beliefs. This view is problematic, however, as animals are clearly prone to failures of recognition as well, which entails that animals can have distinct but co-referential concepts just as humans do. A Fregean normally explains this fact by claiming that such concepts have distinct senses, so as explain why certain behavior would not be irrational. For instance, a dog who is not afraid of his master can rationally be afraid of his master if he fails to recognize the person he is afraid of as his master. So how should the Fregean respond? Should she uphold the idea that animal concepts do not express senses to account for why de dicto ascriptions make no sense, or should she attribute senses to animal concepts to provide the usual explanation for the rationality of behavior that would be irrational from a purely Referentialist point of view? Either way, the Fregean seems to face a substantial difficulty.

On the face of it, a Referentialist semantics seems more promising in this regard. In case of recognition failures, it can attribute the same reference to distinct mental vehicles in the animal

mind. That way, it can explain the rationality of differing cognitive attitudes towards the same object while at the same time accounting for the futility of attributing de dicto beliefs to animals. However, Referentialism is problematic as well. To see this, one can imagine that a dog sees his master but fails to recognize him as he is disguised as a scarecrow. The dog subsequently takes flight because it is afraid of scarecrows. In such a scenario, one can truly say that the dog ran away because it believed that the scarecrow is dangerous, but one cannot truly say that the dog ran away because it believed that its master is dangerous. Yet on a Referentialist semantics, both statements are in fact equivalent, as they match the same desire, individuated by its content, with the same belief, similarly individuated by its semantic content. So how can the Referentialist maintain that one explanation is correct but that the other is not? Clearly, the underlying problem is that referential content is not fine-grained enough to make sense of animal cognition and the behavior it causes. What Referentialism fails to capture is the fact that in the correct explanation, the same concept is used in both the belief and the desire, while in the incorrect explanation, a different if co-referential concept is used instead.

Insofar as the Referentialist approach adds the vehicle of content as a determining factor, it points in the right direction, however. A Fregean can attempt to appropriate this strategy by claiming that a syntactic difference in vehicle amounts to a difference in sense within individual animal minds, while at the same time maintaining that senses cannot be shared across animals. That allows the Fregean to properly explain animal behavior, unlike Referentialism, and yet ban animals from being attributed de dicto beliefs, insofar as the beliefs of one animal can only be compared to the beliefs of another in terms of referential content. An initial drawback of this proposal is its ad hoc nature, however, as the proposal fails to provide a theoretical justification for the partial application of the theory of senses. The more substantial problem, though, is that it is hard to make sense of given the Fregean theory of senses in the background. If animal concepts express Fregean senses, there will always be a fact of the matter whether the two concepts of distinct animals express the same sense or not. Each and every token concept token will express a specific sense, and this abstract object will either be same for two token concepts or not, independent of whether the two tokens belong to the same or distinct animal minds. As a result, the best a Fregean can do is to maintain that the limitation on determining sense-identity across animal minds is epistemological. In other words, the Fregean has to claim that for distinct animals it cannot be known whether two concept tokens express the same sense, even if there is a fact of the matter whether the concept tokens of distinct animals are actually sense-identical or not. This is not a very plausible suggestion, however. The fundamental problem is not that there are epistemological difficulties in ascertaining whether one dog's master concept is the same as another dog's master concept, in addition to being merely co-referential. It is rather that there is nothing to determine to begin with. In other words, the problem is not that a theorist is unable to know whether the co-referential concept tokens of distinct animals have the same sense or not, the problem is that it does not even make sense to say that they do or do not have the same sense. What could possibly be the rationale for saying that two such co-referential concept tokens are sense-identical rather than sense-distinct? This shows that while a theorist has to be able to properly type-identify concept tokens within individual animal minds to make sense of animal behavior, it should be done in a way that does not allow for the simultaneous type-identification of concept tokens across animal minds. A Fregean sense theory, however, is unable to do so.

A Relationist semantics, in contrast, can meet this demand. The main reason is that Semantic Relationism offers a systematic distinction between a weak and a strong version of de dicto belief attributions (Fine 2009: 103). The weak de dicto takes into consideration intrasubjective coordination, and hence the type-identity of the concepts within the set of beliefs ascribed. On the weak de dicto standard, it is correct to ascribe to someone who believes that Hesperus is nice because Hesperus is a star the belief that Phosphorus is nice because Phosphorus is star but not that Hesperus is nice because Phosphorus is star, as the latter fails to properly take into account the connection between the concepts in the original belief set. The strong de dicto version additionally considers the intersubjective coordination between the concepts ascribed in the belief and the concepts used for the ascription. This makes it incorrect, for instance, to ascribe to someone beliefs about Hesperus by using the concept for Phosphorus, even if the internal conceptual pattern is respected. This distinction between a weak and a strong de dicto allows for more adequate view on animal beliefs attributions. The discussion so far strongly suggests that it makes sense in the case of animal beliefs to speak of both de re and weakly de dicto adequate ascriptions, but not strongly de dicto adequate ascriptions. From this point of view, the problem with Referentialism is that it cannot accommodate de weak de dicto. The problem with Fregeanism is that it can accommodate the weak de dicto only by bringing in the strong de dicto at the same time. Semantic Relationism, in contrast, can account for both de re and weakly de dicto belief ascriptions to animals while disallowing strongly de dicto ascriptions. The reason is the way coordination is grounded. Intrasubjective coordination is grounded syntactically, and hence there are semantic facts about the intrasubjective coordination of animal concept tokens, given that these tokens have syntactic properties. This explains why weak de dicto belief ascriptions are possible for animals. Intersubjective coordination, in contrast, is grounded in facts about linguistic communication, which does not exist in the animal case. Hence, there are no semantic facts about intersubjective coordination between animal concept tokens, which explains why strong de dicto belief ascriptions are not possible.

Since type-identity is based on intersubjective coordination, the upshot of Semantic Relationism is that there is no fact of the matter whether two co-referential concepts tokens of distinct animals are type-identical or not. They can be determined to be co-referential, but that is not sufficient for type-identity, as evidenced by the fact that animals can have type-distinct concepts about the same object. It is possible, though, to ascribe concept tokens to animals and to identify them referentially across multiple animals, which establishes that distinct animals think about the same object. This allows for explanations of certain types of animal behavior, for instance when a group of animals displays a concerted behavior towards a prey or a threat. It is also possible to distinguish concepts syntactically within individual animal cognitive systems, which makes it possible to distinguish them semantically as well. This in turn enables other types of animal behavior to be explicable, for instance cases in which animals fail to recognize an object. Hence, both the referential and the intrasubjective dimension of semantic content are available to type animal concept tokens. Unlike in the human case, however, intersubjective coordination is not available to type-identify concept tokens across animals. It is important to realize that this point is not epistemological, but ontological. On a Relationist semantic theory, it is not an epistemological difficulty to determine whether two co-referential concepts of distinct animals are type-identical or not. Rather, there are no facts to ground coordination that would enable such a determination. There are no facts about whether two co-referential concepts of distinct animals are coordinated or not, and hence there are no facts about their type-identity either. It is also crucial to understand that such a determination

would serve no useful purpose in the animal case. In the human case, type-identity across subjects is essential for the theory of linguistic communication, for instance, but there is no corresponding explanatory role for type-identity across animals. There is manifestly no animal behavior to be explained by virtue of type-identical concepts across animal minds.

By providing a plausible view on which standards of adequacy are possible in the case of animal beliefs, Semantic Relationism steers a middle course in the debate about animal concept possession. On the one hand, it suggests that proponents of the continuity hypothesis are partly correct, as it is possible to ascribe beliefs to animals in a more fine-grained way than just by what these beliefs are about. The reason is that animal concepts share with human concepts intrasubjective coordination as semantic content in addition to reference. On the other hand, it shows that the proponents of the discontinuity hypothesis are also partly correct, given that it not possible to ascribe intersubjective coordination to animal concepts. Hence, there is indeed a fundamental difference between the semantic content of animal and human concepts. A Fregean, in stark contrast, does not have this option. On a sense-based approach, animal concepts either express senses or they do not. Hence, a Fregean has to accept the continuity hypothesis or reject it. Either way, the Fregean has to take a position in the existing debate. Semantic Relationism, in contrast, shows that neither position is entirely correct and offers a plausible alternative, which considerably improves the terms of the current debate about animal concepts. At the same time, it also offers a plausible explanation for the impasse reached in the debate[28]. Since an adequate theory of mental content entails that the content of animal concepts partially matches that of humans, neither simply attributing nor simply denying animals concepts with the same content as humans is entirely satisfactory. Put simply, the notion of semantic content for human concepts has three dimension, only two of which are available in the case of animals. This makes it clear why theoretical agreement is hard to achieve. If the view is that animals do not have concepts like humans at all, the two available dimensions are disregarded, but if the view is instead that animals have concepts exactly like humans, the difference in the third dimension is not properly taken into account.

The resulting reconciliatory position is not without precedent, as Newen and Bartels also reject the view that animal concept possession is a simple either or question (2007: 294). However, the reasons given here are, at least at first glance, different from what Newen and Bartels offer. Their point is largely based on the distinction between the role of concepts in discriminating objects and in classifying them according to objective standards (2007: 288). Animals are supposedly able to do the former, but not the latter (2007: 288). Prima facie, however, it seems plausible to assume that semantic coordination plays an important explanatory role for this distinction as well. Arguably, the capacity for discrimination only requires minds to have distinct representations for objects, which requires intrasubjective coordination. Objective classification, in contrast, depends on the identification of mental representations across multiple organisms, which requires intersubjective coordination. At any rate, Semantic Relationism allows for a systematic explanation of both the basis for, and the boundaries of, attributing concepts and beliefs to animals. The approach thus partially vindicates Davidson's influential position by corroborating his stance against full-fledged de dicto belief ascription to animals, while at the same time undermining his overall skeptical conclusion (Davidson 1982; 1984; 1999). Pace Davidson, belief and concept ascription to animals is permissible within the constraints set by the semantic content ascribable to animal minds.

[28] See Allen (1999), Stephan (1999), Cheney and Seyfarth (2007), Newen and Barthels (2007), Camp (2009), Carruthers (2009), Dreyse (2011).

6.6.2 Twin Cases

Adopting a Relationist theory of mental content has ramifications for the much discussed Twin Cases as well. These can only be adumbrated here, as the primary aim is merely to illustrate the broader philosophical impact of a Relationist semantic theory. As is well-known, Twin Cases are thought experiments relevant for the question whether semantic content, and mental content in particular, is broad or narrow. Roughly, mental content is said to be narrow if it depends only on the individual and not his environment, and it is broad if it depends on factors that are external to the individual. For current purposes, the main issue between both views on mental content is whether mental symbols differ in content if they refer to different objects (or properties) that differ in a way that is not discernible to the individuals concerned. The original and most famous case, due to Putnam, compares a person called Oscar on earth, who has a water concept, and his twin, Twin Oscar, who is an exact molecular copy of Oscar on Twin earth and who has a water concept as well (Putnam 1973: 700). The crucial point then is that Twin earth is also an exact molecular copy of Oscar's earth with the sole exception that the substance which looks and behaves exactly like water on Twin earth is in fact a different chemical substance[29]. The fundamental question Putnam then raises is whether Oscar and Twin Oscar share a concept when they use the term "water" or whether they each use the word "water" to express distinct concepts. In the present context, this amounts to the question whether the original Oscar and his twin each have a token of same type of concept or whether their tokens are type-distinct. Proponents of the broad content view argue that the tokens are type-distinct because they refer to different substances, even if the difference between the substances is unrecognizable to both Oscar and his twin. Hence, they argue that differences in reference matter for the content, and therefore the type-identity, of concepts, even if these differences are not discernible to the bearers of the concept. Proponents of the narrow view argue, in contrast, that both Oscar and his twin share a token of the same concept type. The main motivation for this claim is that both concepts are contained in exactly the same beliefs and cause exactly the same behavior. For instance, when thirsty, both Oscar and this twin will have the desire to drink what they call water, and they act accordingly in the presence of the watery substance. To emphasize this point, an additional thought experiment is offered, in which Oscar and Twin Oscar magically switch their place, thus highlighting the fact that nothing changes in either their beliefs or the behavior that results from them, which is taken to suggest that their concepts are tokens of the same concept type.

Adopting a Fregean terminology, the main issue is whether the twins have token concepts that express the same sense, in which case the reference of the unique concept is heterogeneous, as the proponents of narrow content claim, or whether their tokens express different senses by virtue of referring to different substances, as the proponents of broad content maintain. It is important to note that the Fregean principle that sense-identity entails co-reference does not by itself to settle this issue, as the advocates of narrow content can maintain that both concept tokens refer to the same disjunctive property. It is also important to realize that on a Fregean semantics an answer to this question must be available, as the question which sense a token concept expresses is entirely independent of which senses other tokens express. Hence, on a Fregean semantics, both concept tokens express a sense, and there is must be an answer to the question whether these senses are the same or not. It is possible, of course, to argue that in some cases the answer cannot be known, but

[29] As is common in the literature, the fact that humans are composed to a large extent of water is ignored.

that does change the fact that the expressions in question either express the same sense or they do not.

A plausible analysis of the root cause of the debate between narrow and broad content is that it pits the aboutness of concepts, which suggests that external differences matter even if they are unobservable, against the causal role of concepts for cognition, which suggests that only psychologically accessible factors are relevant. In other words, the debate contrasts the objective role of concepts, which focuses on what conceptual content tells about the external world, with the subjective role of concepts, which is about how conceptual content is involved in reasoning and guides individual behavior. An interesting corollary of Fregeanism is that it has to privilege one of these roles. A Fregean is theoretically committed to the twins' concept tokens being either type-identical or type-distinct, as the tokens either do or not do express the same sense. Since there is no possible third alternative, the Fregean has to accept that either the narrow or the broad view is correct.

In contrast, the same does not hold for Semantic Relationism. For the Relationist, type-identity in such cases depends on intersubjective coordination, which in turn depends on communicative facts. Twin Cases as they are usually described in the literature, however, do not involve linguistic communication between the twins. This means that they do not include communicative facts that would ground facts about intersubjective coordination. As a result, the Relationist will conclude that in standard Twin Cases, there is actually no fact of the matter whether the concepts are coordinated, and thus type-identical, or not. It follows that the main issue between the broad and the narrow content proponents cannot be decided. On a Relationist semantics, Twin Cases as usually described are underdetermined in terms of the facts that are necessary to answer the principle question of the debate.

The main upshot of a Relationist semantics is therefore that standard Twin Cases are not adequate to decide between a broad and a narrow conception of mental content. This outcome arguably has intuitive plausibility as well. It is certainly not unreasonable to maintain that in standard Twin Cases there is no basis for the claim that the concept tokens are type-identical. In fact, the real question is what, if anything, would motivate a claim either way. A plausible response is that the question depends crucially on how the concepts would potentially be involved in communication. What would happen, that is, if the twins were to interact linguistically? There are obviously two options. If the twins interact by employing the same mental representation when using the word "water" to communicate about water and the watery substance indiscriminately, then the most plausible view is that both their tokens belong to the same concept type, which, accordingly, has disjunctive reference. The theoretical basis for this claim is that in that case the tokens are suitably coordinated to count as type-identical. If instead each twin forms a new token to interpret the word "water" as used by the other, the lack of coordination between the initial concept tokens implies that the tokens are not type-identical. As long as no interaction takes place, however, the question cannot be settled. From a Relationist perspective, the main problem with the debate is thus the underlying assumption that the issue about concept identity can be answered given the facts included in the standard version of the Twin Case thought experiment. The mistake is to try to answer the question about concept identity in cases that do not contain the relevant semantic facts, which are necessary to determine whether the concept tokens are type-identical or not. Trying to do so is to ignore the fundamental underdetermination of the relevant semantic facts by the facts included in the standard Twin Cases.

On further reflection, a Relationist semantics even challenges the fundamental if tacit assumption that Twin Oscar has the same beliefs as Oscar just because he is a molecular duplicate of the latter. The reason is that physical identity, which is enough to ensure that a mind is identically structured syntactically, is intersubjectively not sufficient to guarantee semantic identity and hence type-identity[30]. Put simply, a similarly structured brain does not entail an identical set of beliefs. It entails a similarly structured set of thoughts, but that does not mean that these thoughts have the same content. Presumably, this is most problematic for the proponents of narrow content, as it entails that physical duplication only preserves intrasubjective coordination patterns, but that does not guarantee that the mental symbols that are syntactically identical also have the same content. The reason is that sameness of content depends essentially on intersubjective coordination, for which physical duplication is irrelevant, as it depends on facts about the communication between individuals and not on syntactic facts about those individuals considered individually. Moreover, the fact that mental symbols are involved in the same syntactically complex structures is not sufficient to maintain that they have the same content either, if only because it is perfectly possible for one person to believe about an object what a second person believes about another and vice versa. Hence, the idea that physical duplicates have identical beliefs has very little theoretical support. At any rate, this does not mean that proponents of the broad conception of content are therefore correct. In fact, from a Relationist perspective, both are equally misguided insofar as they attempt to determine sameness of semantic content, and hence type-identity, on the basis of cases that are unsuited for the task at hand by virtue of being fundamentally underdetermined. That way, Twin Cases are a case in point to show that a Relationist semantics has theoretical repercussions in the philosophy of language and mind beyond the core issue of Frege's Puzzle for the Language of Thought.

[30] The underlying problem is presumably that it is easy to forget that Oscar and his Twin are two distinct individuals despite the fact that they are identical on a molecular level.

Chapter 7

Concepts and Propositions

7.1 Introductory Remarks

The main objective in this chapter is to offer a theory of concepts and propositions to complete the theory of mind and the Relationist theory of content defended so far. The main focus is on the theory of propositions, as the proposed theory of concepts is already well-developed in the literature. The conception of propositions proposed in this chapter is, in contrast, not very prevalent in current philosophical research. A major motivation for this novel take on propositions is that it parallels a widely held theory of concepts as mental representations. The guiding principle is thus to start from a well-known conception of concepts as bearers of semantic content and to advocate a similar conception of propositions. On this view, propositions are syntactically complex mental representations that are vehicles of semantic content. Semantic content, in turn, is considered a semantic property of mental representations, rather than being a semantic entity to which mental representations stand in a certain semantic relationship. Before going into the nature of propositions and semantic content on this proposal, however, first a few remarks on the theory of concepts as mental representations in the context of the Language of Thought and its Relationist content.

7.2 Concepts

A fundamental debate in the philosophical literature concerns the ontological nature of concepts, specifically the question whether concepts are mental or abstract objects[1]. As Sutton correctly points out, the debate is a substantial ontological dispute about the nature of concepts, which all participants agree are entities that play a specific theoretical role (2004: 89). A well-known defender of the view that concepts are mental objects is Fodor. According to Fodor, concepts are mental representations that are essentially the "constituents of mental states" (Fodor 1998: 6). On Fodor's view, concepts are constitutive of mental states. Even if strongly associated with the philosophical work of Fodor, the view is in fact widely held in philosophy as well as beyond, as it represents a fundamental component of a representational theory of mind. The philosophically best-known alternative to Fodor's view is endorsed by Peacocke, who argues that concepts are abstract objects

[1] See for instance Peacocke (1989b, 1991, 1992, 1996b), Zalta (2001), Sutton (2004), Laurence and Margolis (2007, 2008).

(1996b: 409). According to Peacocke, concepts are not mental representations, they are in fact not mental objects at all (1991: 525). Rather than being the constituents of mental states, Peacocke considers concepts to be mind-external objects that can be used to "classify" mental states (1991: 538)[2]. Arguably, the abstract conception of concepts is more widespread in philosophy than in other scientific disciplines that are concerned with the study of the mind. A major motivation for the abstract view is the idea that concepts are metaphysically independent of mental states. If concepts are essentially constituents of mental states, they prima facie depend for their existence on the existence of mental states. However, philosophers such as Peacocke reject the ontological dependence of concepts on thinking beings, and hence they propose a view on which concepts are mind-external abstract objects. Peacocke notes two further important features of concepts that are distinctive if they are abstract objects. Unlike concrete mental representations, abstract concepts have no spatio-temporal location and they are not involved in causal interactions (1991: 525).

An important clarification regarding the debate about the ontology of concepts is that proponents of the mental view generally adopt a type/token distinction for concepts (Sutton 2004: 91-93). Hence, they think that concept tokens are concrete mental particulars, while concept types are abstract objects. The debate about the ontology of concepts can therefore not be understood simply as a dispute about whether concepts are abstract objects or not, as both parties agree that at least some concepts are abstract. Rather, the real dispute is whether concepts are purely abstract, that is, whether concepts are invariably abstract objects or whether some of them are concrete mental objects instead. In other words, philosophers such as Peacocke maintain that no concept ever has a spatio-temporal location or causal powers, while theorists such as Fodor think that concepts can have both if they are concrete mental representation tokens rather than their abstract types.

The type/token distinction is important not only to properly understand the debate, but also in view of two arguments against the mental view already mentioned. The first argument, due to Frege, is that concepts cannot be mental representation because concepts are objectively shared across thinkers, while mental representations are unique to each thinker. The second argument, due to Peacocke, is that concepts cannot be mental representations because concepts can exist without there being a representational mind, while mental representations cannot. The proponents of the view that concepts are mental representations counter these arguments by pointing out that concepts as mental entities actually meet these constraints. So they defend their proposal not by rejecting the constraints, but by pointing out that concepts as types in fact meet them. While it is true that individual tokens are not shareable, for instance, as every mind has its own tokens, the same is not true for concepts as types. They can be objectively shared, in the sense that different thinkers can have tokens of the same concept type. The same holds for existence as well. It is true that individual concept tokens exist only in individual minds, so that their existence depends metaphysically on the existence of the mind that contains them. The same is not true for concepts as mental representation types, however. They can exist even if they are not tokened. Concepts types can thus exist even in the absence of representing minds. Hence, once the constraints are properly understood as applying to the types rather than the tokens, the proposed theory of concepts can meet them. That way, the arguments against the mental conception are invalidated by the fact that they disregard the type/token distinction that holds for concepts as mental representations[3].

[2] This idea is explained momentarily.

[3] As mentioned, Laurence and Margolis (2007: 568) develop these defensive counterarguments on the basis of a point

On the proposed mental conception of concepts, concept tokens are concrete mental entities encoded in the brain, while the corresponding types are abstract objects that are ontologically on a par with expression types more generally (Fodor 1998: 10)[4]. More specifically, concept tokens are physical symbols in the brain, which are constituted by concrete arrays of some binary signal that can be abstractly represented by a sequence of binary symbols, such as 1's and 0's[5]. It is important to keep in mind at this point the multiple realizability of semantic content, which entails that no concrete physical symbol is intrinsically connected to a specific concept. Any concept can in principle be physically realized by any mental symbol. The proposed view can accommodate this fact, however, as it is not their physical properties, which Fodor generally calls their "shape", that turn distinct physical symbols into tokens of the same concept type, but the semantic properties they share[6]. Since different symbols in different minds can have the same semantic properties, the multiple realizability of content is respected.

What is the fundamental advantage of having a view on which mental representations are concrete objects, though? As Gallistel and King point out, as many have done before them, Fodor notably included, a view on which mental representations are physical entities is necessary to understand how a physical system can be a representational system (2009: xi). In Fodor's words, it fundamentally explains how something in the realm of logic, namely thinking, which is governed by principles of reasoning such as validity and rationality, can exist in the natural realm, which is governed by physical principles such as causality (Fodor 1998: 10-12).

Going back to the question about the ontology of concepts, a crucial aspect to understand the rationale of the debate is the underlying semantic dispute. The view that concepts are pure abstract objects is in fact strongly linked to a Fregean semantics, as it is based primarily on the idea that concepts are Fregean senses. The mental alternative, in contrast, suggests itself on a Referentialist semantics, as the semantic theory does not posit abstract Fregean senses with which concepts can be identified. This explains why many Referentialists think concepts are mental representations, while many Fregeans reject this idea. To be sure, it is not the case that the ontology of concepts is connected to a specific semantic theory as a matter of conceptual necessity. Evidently, a Fregean can also maintain that concepts are mental representations, and a Referentialist can maintain that concepts are abstract objects other than Fregean senses. The connection holds more as a matter of historical fact. Philosophers such as Peacocke and Zalta, who advocate the view that concepts are abstract objects, also endorse a Fregean semantics, while the best-known proponent of the mental alternative view of concepts, Fodor, is at the same time a staunch defender of a Referentialist semantics. Peacocke in fact explicitly makes the connection between a Fregean semantics and a theory of abstract concepts. He claims that concepts are not mental representations but "ways in which" such mental representations present their reference, which is precisely the definition of a Fregean sense (1991: 525). This also explains Peacocke's claim that concepts, while not being part of mental states, can be used to classify these states. By this Peacocke simply means that concepts as Fregean senses are part of the content of mental states, and that mental states can be classified on the basis of their content. This is of course a very natural way to classify

Fodor makes (1998: 20).

[4] The ontological status of types is itself far from obvious. For discussion, see Wetzel (2009, 2011).

[5] In this sense, Gallistel and King speak of "neural signals, streams of action potentials (aka spikes). The spike trains" (Gallistel and King 2009: 1). However, symbols also have to be stored in long-term memory, in which case the binary signal has to be different, for instance the state of a molecule called rhodopsin (Gallistel and King 2009: 280).

[6] (Fodor 2008: 80).

mental states, as it will "group" mental states that are about the same object represented in the same way, which corresponds exactly to the idea that mental representation tokens are type-identified by their semantic content as defended in this thesis. Fodor similarly makes an explicit connection between the semantic theory and the theory of concepts. He argues that Frege's modes of presentations "must be mental objects" (Fodor 1998: 20). The basic idea is that how something is presented is a matter of vehicle rather than semantic content. Hence, it is natural for Fodor to assume that concepts, a major role of which is to capture how something is represented, are mental representations rather than abstract Fregean senses. That way, each semantic theory suggests a very natural view in the debate about the ontology of concepts.

As a result, the metaphysical debate about concepts is closely connected to the question which semantic theory is correct. From the point of view of semantic theory, the most important difference between both approaches to concepts lies in the way they conceive of the relation between concepts and content. On the view that concepts are Fregean senses, concepts are part of the semantic content of expressions. On the view that concepts are mental representations, they are not contents but rather the bearers of semantic content. Hence, both approaches differ radically in the way they perceive the relation between concepts and semantic content. In short, for philosophers such as Peacocke concepts are part of a semantic theory, while for Fodor and others they are rather part of what a semantic theory is a theory of.

Given the considerations offered so far, what theory of concepts should the Relationist adopt? This thesis ultimately endorses the Fodorian conception of concepts as mental representations. On this view, concepts are essentially mental entities that are the bearers of syntactic and semantic properties. That way, concepts are also essentially the relata of semantic relationships. Given a Relationist semantics, they are essentially the relata of coordination relations, but they are also essentially the relata of the referential relations that hold between mental symbols and the extra-linguistic objects to which they refer. More precisely, the proposed view is that the semantic properties of mental symbols, and the semantic relations in which they stand, are fundamentally what gives the physical symbols in the mind their representational nature. In other words, mental symbols are mental representations only because of the semantic properties they have and the semantic relationships in which they stand. Unfortunately, it is not possible to provide all the reasons for the assumption that concepts are mental representations with syntactic and semantic properties here. The basic motivation, however, is the fundamental importance of the view for the classical computational and representational theory of mind, which is in turn motivated by the fact that it can explain the known cognitive capacities of human minds, especially in view of the fact that potential alternatives, such as connectionism, appear to be limited in that respect.

Moreover, there is little need to explicate and motivate the mental conception of concepts in great detail in this thesis, as the view is already well-developed within the philosophy of language and mind and other areas of research like psychology, linguistics and cognitive science. Hence, it makes sense to focus instead on how Semantic Relationism supports a mental conception of concepts, which it does in two ways. On the one hand, it positively allows for the proper type-individuation of concept tokens in the face of Frege's Puzzle for the Language of Thought, in marked contrast to Referentialism. Because of Frege's Puzzle, Semantic Relationism is essential for the viability of the theory of concepts as mental representation types and tokens. On the other hand, Semantic Relationism undermines Fregeanism as a general solution to Frege's Puzzle. That way, it illustrates

the theoretical shortcomings of a Fregean sense theory. In a negative way, it thus motivates the view that concepts are mental representations by eliminating its main philosophical rival, at least to the extent that concepts are identified with Fregean senses, which is unquestionably the driving force behind the abstract conception of concepts in philosophy. Hence, Semantic Relationism renders the mental conception of concepts possible while at the same time casting serious doubt on its main philosophical alternative.

In contrast to the semantic theory actually required to make it viable, however, the view that concepts are mental representation is widely adopted in the literature. It is therefore reasonable to focus on the analogous possibility for propositions instead. The main idea is to consider propositions bearers of semantic content rather than contents, in analogy to the fact that concepts are also the bearers of semantic content if they are mental representations. Despite this analogy with the widespread theory of concepts as bearers of content, however, the view that propositions are syntactically complex mental representations is practically nonexistent in current philosophical research. Even Fodor, a strong champion of both naturalism and a mental conception of concepts, advocates a traditional view on which propositions are complex content entities expressed by thoughts, which are sentences in the Language of Thought (1998: 25). Using Fodor's terminology, the alternative proposal here is effectively to collapse Fodor's distinction between thoughts and propositions, based on the idea that propositions as understood by Fodor, on which they are syntactically structured content entities, are theoretically redundant. The semantic content of sentential expressions is instead taken to consist in a complex property of expressions, rather than a complex entity to which expressions are related by a semantic relation of "expressing". In the next section, this idea is developed and defended in detail, in reference to the requirements imposed by Schiffer on any adequate theory of propositions and in comparison to two recent alternative proposals due to Soames and King.

Before looking at propositions more closely, however, it is worthwhile to reiterate that inconsistencies are possible in the theory of types because of cases of semantically faultless transitivity failures. This evidently affects the proposal that concepts and propositions are mental representation types. It was mentioned that this fact perhaps suggests a more Nominalist approach to the abstract concept and proposition types, as in the biological case, where the category of a species is based on the relation of interbreeding, which can also lead to inconsistencies. On the other hand, however, it was also argued that there are countervailing reasons to adopt a more Platonic conception of concepts and propositions, most notably the widespread assumption that propositions can exist independently of representing minds. The current proposal is manifestly predicated on the sense that these issues, while tricky, are ultimately solvable. A major reason to assume that propositions are Platonic objects is the fact that there can be truths without minds, which can hardly be denied. For instance, it is true that five is bigger than three, and this truth manifestly obtained even before the existence of representational minds. This fact, together with the the idea that propositions are the primary truth bearers, which entails that there can be no truths without propositions, suggests that propositions can exist without minds. This motivates the claim that propositions as types can exists even without tokens, which seems to run counter to a Nominalist response to the possible inconsistencies in the theory of propositions as types.

Perhaps a nominalist conception of concepts and propositions can still be maintained, however, once a proper theoretical distinction between facts and propositions is in place. The basic idea is

to maintain that phrases such as "it is true that" are actually ambiguous between a reading on which they mean something like "there is a fact that" or "it is a fact that" and a reading on which they mean "there is a true proposition to the effect that". If so, the mind-independent truth of five being greater than three can be understood in that it is a fact that five is greater than three, rather than there being a true proposition to the effect that five is greater than three. Such a fact can of course be represented by a true proposition, but the crucial point is that the fact remains even if there is no proposition that represents it. On this view, the mind-independent truth of five being greater than three points to a fact rather than a proposition, and so it is no longer necessary to assume that there are propositions independent of representational minds to explain the existence of mind-independent truths. It is important to realize that this is not to suggest that facts rather than propositions are the primary bearers of truth, however. The claim is rather that the phrase "it is true that" can be used in a way in which it means "it is a fact that". Facts exist or obtain, but they are not true. As a result, this strategy conceivably allows for a nominalist conception of types without denying either that there are "truths" independent of representational minds or that propositions are the primary bearers of truth. At any rate, the aim in next section is to develop in greater detail the view that propositions are the mental bearers of semantic content.

7.3 Propositions

Unlike the previous chapters, the proposal about propositions offered here is less interconnected with the prior discussion. The view that propositions are syntactically structured mental representations is rather judged on its own merits, independent of the prior arguments given in favor of a Relationist semantics and a Language of Thought based approach to the mind. The section is also in large part descriptive rather than argumentative in nature, for two main reasons. First of all, the proposal is more tentative. Accordingly, the major aim is to advertise a plausible alternative conception of propositions rather than to attempt to establish it conclusively. Secondly, it is perfectly possible to adopt a Relationist semantics for the Language of Thought while rejecting the proposed conception of propositions in favor of a more classical approach[7]. The reason to nevertheless include the alternative proposal on propositions in this thesis is that it is ideally suited to complement the main theses defended so far. While the Language of Thought hypothesis provides the concrete objects that are taken to be proposition tokens, Semantic Relationism offers a theory of content that allows for the proper individuation of these tokens into proposition types.

The fundamental idea developed in this section is that propositions are syntactically structured mental representations. As noted already for concepts, this depends fundamentally on a type/token distinction. While propositions as mental representation types are abstract objects, like numbers and sets, their tokens are concrete physical objects realized in the brains of thinkers. Importantly, on the proposed view, two proposition tokens count as type-identical if and only if, and in fact because, they have the same content, which entails that type-identical proposition tokens have the same syntactic structure and the same basic constituents with the same content. The basic constituents, which are concepts, can either be referential or non-referential. If they are referential, they have the same semantic content if and only if they are co-referential and coordinated. If they are not referential, identity of semantic content has to be determined differently, for instance

[7] Fine, for instance, adopts a Russellian conception of propositions (Fine 2009: 54-55).

by sameness of conceptual role. The crucial way in which this proposal departs from classical accounts is that it considers propositions entities that have content rather than entities that are content. By defending the view that propositions are bearers of content, two major claims are defended at the same time. On the one hand, the proposal claims about propositions that they are mental representations with sentential structure. On the other hand, the proposal claims about semantic content that it is not an object but a property. This means that the content of a sentential expression is not a complex entity to which the expressions bears a semantic relationship, but is rather considered a complex semantic property of that expression.

This section is structured as follows. The first subsection introduces the topic by presenting a few historical remarks on the theory of propositions as well as some preliminary observations on the connection between propositions, semantic content and truth. In the second part, Schiffer's deliberations on the theoretical roles of propositions are discussed in order to assess whether they need the standard view on which propositions are contents. Next, an argument from Schiffer against the view that propositions are sentential objects, which is the basic claim here insofar as propositions are considered sentences in the Language of Thought, is considered and rejected. In the third part, positive reasons for the view that propositions are content bearers are presented. After that, the subsection further motivates the proposal by comparing it favorably to two prominent recent alternative suggestions on the nature of propositions due to King and Soames. That way, the first two subsections aim to show that a view on which propositions are content bearers is possible, while the final subsection aims to establish that such a view is in fact preferable as well.

7.3.1 Preliminary Remarks

The standard view in philosophy is that propositions are contents, which are expressed by linguistic expressions and to which various mental states, such as beliefs, are attitudinal relations. Roughly, to say something is to utter a sentence that expresses a proposition, and to believe something is to stand in a believing relation to a proposition. As contents, propositions are generally considered the primary bearers of truth and falsity. Frege has unquestionably played a major role in establishing this idea and its prominent status in philosophy. Frege famously argues that thoughts, which for Frege are the senses of sentences, are primarily true or false, rather than the sentences that express them (Dummett 1993: 8)[8]. As Dummett explains, for Frege this actually follows naturally for sententially complex expressions from his doctrine for basic expressions. According to Frege, the senses of expressions, rather than the expressions themselves, are the primary referring entities, which means that referential expressions only refer to objects by virtue of expressing senses that do. Moreover, Frege holds that truth consists in the reference to the value "the True", which he considers a sui generis kind of semantic object (Frege 1892: 34). However, if senses are the primary referring entities, and truth consists in the reference to "the True", it follows immediately that thoughts are primarily true or false rather than the sentences that express them.

As Dummett points out, however, Frege is actually less committed to this view than it may seem:

> "[In] practice, however, Frege never conformed to this order of priority when expounding the distinction between sense and reference."
> (Dummett 1993: 8)

[8] By general agreement, thoughts in Frege's theory are equivalent to propositions in other accounts.

Frege in fact speaks first of expressions having reference, and introduces senses only afterward, primarily to deal with co-referential expressions that are nonetheless semantically distinct. Dummett also notes that the view is at odds with Frege's well-known conception of senses as "ways of referring" (Dummett 1993: 9). The reason is that it requires reference to be defined prior to sense, which entails that sense cannot be considered the primary referring entity. Moreover, if senses are essentially about how linguistic entities relate to their reference, they should not themselves be among the primary relata of that relation. From this Dummett concludes that the same holds in the case of truth as well. Given that for Frege truth consists in the reference to "the True", being true or false is primarily something sentences are, and not the thoughts they express. Fregean thoughts are rather a way for true sentences to refer to "the True", which is a way for them to be true. This indicates that in practice even for Frege sentences, or more generally, the bearers of semantic content, are the primary bearers of truth and falsity rather than their contents.

This historical observation raises an important question about the connection between propositions and truth. Is it possible to reconcile the claim that content bearers are the primary bearers of truth values with the claim that propositions are? An obvious way to do so is to maintain, contrary to accepted opinion, that propositions are content bearers rather than contents, which is precisely the view proposed here. However, it is evident that a historical observation does not constitute an argument in favor of a view. The purpose of these introductory remarks is merely to highlight a certain historical continuity in the line of thought that the primary bearers of semantically fundamental properties such as truth are content bearers rather than contents. Admittedly, the point Dummett makes about Frege relies on a conception of senses as "ways of referring" that is perhaps more important to Dummett than Frege. Even so, it does show that the historical support for the standard view is not as clear and uncontroversial as is widely assumed.

At this point, it is useful to make a few terminological remarks about propositions and thoughts. As is well-known, for Frege thoughts are complex abstract entities that are the contents expressed by sentences, and the constituents of which are the senses of the constituents of the sentences that express them. Hence, the thought expressed by "three is a number" has the senses of the words "three" and "number" as constituents. Russel, in contrast, speaks of propositions as the contents of sentential expression, and famously holds that these can contain real objects, which are Fregean references rather than senses, as constituents. The Russellian proposition that three is the number contains the number three and the property of being a number as constituents (McGrath 2008). It is generally accepted that Fregean thoughts and Russellian propositions play effectively the same role in their respective semantic theories. In contrast, Fodor uses the notion of a thought in a very different way than Frege. For Fodor, a thought is a Language of Thought sentence that is composed of concepts, and these concepts are in turn words in the Language of Thought. Thoughts as understood by Fodor are content bearers that express propositions, which Fodor, who rejects a Fregean semantics, conceives of in much the same way as Russell.

Using Fodor's terminology, the proposal offered in this chapter is that propositions as classically understood do not exist. Classical propositions are theoretically redundant, as it is possible, and indeed preferable, to think of the content of sentential expressions as a complex property rather than a complex content entity. So just as "being green" is not an object, but a property an object has if it is green, a proposition is an object that has the complex content that John likes Mary, say, as a semantic property if it is a proposition to the effect that John likes Mary. On this view,

propositions are bearers of content, rather than the contents of some alternative bearer such as a natural language sentence or a Fodorian thought. It is important to note that the difference with Fodor and others is not purely verbal, as the proposal maintains that propositions as bearers are in fact the entities that play the roles most theorists accord to propositions as contents. This explains the claim that propositions as classically understood are theoretically redundant. The choice to call the content bearer "proposition" rather than "thought" is of course merely terminological, which is motivated mostly by the fact that it highlights that propositions as bearers are supposed to theoretically supersede propositions as contents. Using propositions as the term for content bearers is supposed to illustrate that propositions as contents are theoretically redundant given that their function is fulfilled instead by propositions as content bearers.

What then is the current consensus on propositions in the philosophical literature? It is fair to say that the only thing all theorists agree on when it comes to propositions is that they are fundamental to philosophy. Beyond that, nothing is beyond controversy. For instance, a disagreement of some historical importance concerns the question whether propositions are syntactically structured entities. Many philosophers follow Frege and Russell in holding that propositions are syntactically structured, but proponents of the view that propositions are sets of possible worlds disagree (King 2008). However, this debate about the structure of propositions is largely ignored here, as are views on which propositions are unstructured entities. More recently, there has been a renewed interest in the nature of propositions triggered by the work of King (2007). King argues that certain problems in the classical account of propositions have never been solved, which is highly problematic given the preeminent role of propositions in contemporary philosophy (2007: 4). The renewed discussion on the nature of propositions has produced some very exciting and surprising new ideas to solve the problems perceived for classical accounts, most notably the suggestion that propositions are acts (Hanks 2011), facts (King 2007; 2012), or even events (Soames 2010b;d). Focusing on these new ideas, the main aim here is to address two fundamental questions about propositions:

(1) What is the relation between propositions and content?

(2) To what ontological category do propositions belong?

As regards (1), the aim is to defend a view on which propositions are not contents. As regards (2), the proposal is that propositions are objects. That way, the proposal deviates radically from the most common conception of propositions in terms of (1) while upholding the classical view in terms of (2), in contrast to the recent proposals from King and Soames. As mentioned, the classical conception of Frege and Russel takes propositions to be objectified contents. Evidently, this view has two components, namely that propositions are objects and that they are contents. King, however, has convinced many that there are fundamental unresolved difficulties in the classical account of propositions. On account of this, King and others have tried to address these problems by effectively giving up the idea that propositions are objects. The alternative proposed here is to solve the problems by giving up the idea that they are contents. This raises several questions that have to be addressed as a result. First, it has to be explained what propositions are if not objectified contents as assumed by the classical accounts. An initial answer to this question has already been provided, though, as the main idea is that propositions are syntactically structured mental representations. Secondly, the proposal has to show that propositions so understood can play the

different roles philosophers have accorded to classical propositions. Thirdly, it has to be explained what it means to say that content is not an object, which is what the classical view assumes, and it has to be shown that a semantic theory is possible without positing complex content entities. Finally, it has to be established that the view is preferable to the current alternatives proposed by King and Soames, who propose to deviate from classical accounts in terms of (2) rather than (1).

What initial reasons are there to think that propositions are content bearers rather than contents? Positively, it emerges from the combination of a widespread view of concepts as mental representations and the similarly common idea that concepts are the basic building blocks of propositions. In combination, they suggest that propositions are the syntactically complex mental correlates of concepts, and as such they are content bearers rather than contents. Negatively, the claim is that the proposed conception of propositions avoids the difficulties that arise for the classical view as regards their structure, their ontology and their representational nature. Finally, it is claimed that the proposed conception is also preferable to the contemporary non-objective alternatives.

Before having a closer look at the nature and role of classical propositions, a few caveats are in order. The first concerns the scope of the discussion. Given the huge amount of literature on propositions, it is evidently not possible to provide a conclusive discussion in this chapter, or to consider the literature on propositions exhaustively or even comprehensively. Since the scope has to be modest, the aim must be as well. Accordingly, the main aim is to establish the viability of a possible alternative to current proposals, to describe how it fits into the existing debate on propositions, and to highlight several of its most advantageous features. Secondly, this section is about the metaphysical nature of propositions, and so it is about propositional attitudes as well, but it is not concerned with the semantics of propositional attitude ascriptions in natural language. As mentioned already, that these are distinct is shown by the fact that in a world with only languages without propositional attitude predicates, questions about propositional attitude ascriptions do not arise, but questions about propositional attitudes still do[9]. Thirdly, this chapter only considers recent proposals in the structured proposition tradition. Although this is largely due to lack of space, a further motivation for this restriction is that the structured account is more prevalent in the context of language processing and reasoning. Finally, it should be noted that the alternative proposals included in this section are not considered in great detail, as the focus is rather on some of their most general aspects which arise from fundamental initial choices. As a result, the discussion is unable do full justice to the finer aspects of these theories, which, however, is not necessary for the purpose at hand either. For example, it is argued that it is mistake to think of propositions as facts, as King does. If that is correct, however, then it obviously does not matter what facts King exactly takes propositions to be. Having said that, what are classical propositions and what are they good for?

7.3.2 Schiffer on Propositions

On the standard view, propositions are contents. More specifically, propositions are taken to be the contents of declarative sentences, they are what declarative sentences express. They are also the objects of propositional attitudes, most notably beliefs, and the primary bearers of truth values

[9] This assumes a realist conception of propositional attitudes. For a detailed analysis and defense of this point, as well as some negative examples, see Heck (2011).

as well as modal properties such as necessity and possibility. As King points out, these features intuitively belong together: what we say and believe is true or false, and perhaps possibly or necessarily so (2007: 2). It is thus very intuitive to think that all these features belong to a unique entity which is the classical proposition.

The fact that the standard view is that propositions are contents that are the primary bearers of truth values cannot be due to a sheer lack of alternatives, however. Prima facie, it is not impossible to think that something like a sentence, a content bearer, is true or false, even if is so in virtue of its content, rather than holding that the content itself, which is the proposition expressed, is true or false. Similarly, it is not obviously misguided to hold that a content bearer is necessarily true in virtue of its content, rather than maintaining that its content is necessarily true. In the case of beliefs, the point is perhaps less clear, as people say things such as "what he believes is true", which seems to imply that the content of the belief is true. However, one can also say "what he uttered is true", and that is most naturally taken to mean something along the lines of "he uttered sentence S, and S is true and has content P" rather than "he uttered S which has the true content P". If so, the same is perhaps true for beliefs as well. "What he believes is true" then means something like "his belief has content P and is true". After all, it is very natural to speak of true beliefs, but not of true contents or true meanings (in this sense). At any rate, it is clear that intuitions about everyday language cannot be the decisive factor in the debate about the nature of propositions. The point here is merely that a view on which content bearers have the features classically ascribed to contents is not as radical as it may appear in view of the fact that it plays virtually no role in contemporary literature, which often takes the content view to be self-evident. It is also worth noting that the intuition expressed by King above only speaks to the fact that a unique entity has the features listed, which says nothing about what that entity is, and in particular whether it is a semantic content or a bearer of semantic content.

It is therefore all the more striking that more often than not very little thought is given to the assumption that propositions are contents. A good case in point is a recent paper by Schiffer, which is discussed in detail next (Schiffer 2011). Schiffer essentially argues that both structured propositions and semantic content are theoretically necessary and thereby takes himself to have vindicated the classical account of propositions as structured content entities. Schiffer's way of proceeding is in fact representative of the philosophical literature at large. His main considerations concern the explanatory role of propositions with respect to propositional attitudes. The problem is that one can grant all of Schiffer's arguments while still rejecting the classical account. One can accept that both content and entities with syntactic structure are necessary, all of which a plausible theory has to provide, without accepting that these coincide in one object. What Schiffer misses is thus a plausible argument for his claim that content is an entity with syntactic structure, which is a fundamental background assumption for the classical account of propositions. Yet the underlying assumption that propositions are contents does not even register in Schiffer's paper, and is thus not explicitly justified either. Importantly, it is not necessary to deny here that the assumption that propositions are contents is sufficient to respect Schiffer's arguments. The crucial point is rather that the assumption is not necessary, because of which it is possible to respect Schiffer's arguments while maintaining that propositions are content bearers rather than contents.

What would the alternative suggestion specifically be in that case? The proposal put forth in this section starts out from the well-known work of Fodor on propositional attitudes, which is well

described by Field (1978). Field divides the relation between a believer and the content of his belief into two components. First, a belief* relation to Language of Thought sentences, which are syntactically structured content bearers, and secondly, a semantic relation between these bearers and their content, which need not be an object (1978: 12). As a result, the alternative proposal offers a syntactically structured entity that has a content, rather than a syntactically structured entity that is a content. That way, it provides what Schiffer's arguments require without identifying the syntactically structured entity with its semantic content, as the classical view does.

A concrete example can make the difference between the classical approach and the alternative suggested in this chapter clear. On the classical view, declarative sentences express propositions, which are the contents of the declarative sentences. Hence, the relation between a declarative sentence and its semantic content is direct. On the alternative suggestion, declarative sentences express propositions in the form of Language of Thought sentences, and these in turn provide the semantic content the sentences are taken to have. The relation between a declarative sentence and its semantic content is thus indirect, mediated via propositions that are mental representational vehicles of content. One can consider the sentence "Mitt is dull" as an example. On the suggested approach, the sentence expresses the proposition MITT IS DULL, which has the content that Mitt is dull as a property. That way, there is no classical proposition or syntactically structured content entity involved. Admittedly, this approach is based on a broadly Fodorian take on natural language and its semantics, which is committed to the idea that sentences have content only in a derivative sense, namely via the mental states of their users. The notion that the content of natural language sentences is derivative on mental states in this way is not that implausible, however, nor is it all that controversial in its general form. It is in fact tempting to consider it an advantage of the suggested approach, as it explains the widely acknowledged semantic dependence of natural language on thought in a way the classical view does not. At any rate, this shows that the classical conception is not without alternative, and it is useful to keep this in mind when considering Schiffer's arguments in view of the roles and characteristics of propositions.

7.3.2.1 The Role of Propositions

Schiffer's discussion on the role of propositions is well-suited as it is both recent and concise, but also because it is representative of the standard view that without much question takes propositions to be structured content entities. According to Schiffer, propositions are necessary (2011: 2):

(3) as sources of information (the information-acquisition role)

(4) for predicting behavior (the predictive role)

(5) for explaining behavior (the explanatory role)

To be sure, propositions have many other roles as well, but these roles capture essentially why propositions are indispensable for propositional attitudes. In their first role (3), the information-acquisition role, propositions allow people to infer what the world is like from what other people believe, assuming people are generally reliable. Propositions yield a connection between what is inside people's heads, which can be accessed through linguistic communication, and the world at large. Beliefs are thus intrinsically connected to the propositions they are mental attitudes about,

and these propositions are in turn closely linked to the external world by holding the world to be a certain way. Hence, on the assumption that a belief is true, justified on the basis of trust, people can infer that the world is the way the belief holds it to be. It is clear that this role of propositions is epistemologically crucial, as much of what people know is actually gained on the basis of testimony. The second, predictive role (4), provides a useful counterpart to this. It allows people to predict, fallibly but reliably, what people believe given the state of the world. It is possible, for instance, to predict that in front of a glass of water, a person will form the belief that there is a glass of water in front of her. The state of the world makes a specific proposition true, and the general knowledge that people strive to have true beliefs suggests that a certain belief is held with a reasonable degree of certainty. This in turn allows people to predict the behavior of others. If a person is known to be thirsty, for example, people can reliably predict that this person will act on the belief and the associated desire by taking the glass and drinking the water (holding steady a great many additional explicit and implicit beliefs). That way, propositions also allow people make sense of the behavior of others, which is captured by their explanatory role (5). In the example, the person reached for the glass because she was thirsty and believed there to be a glass of water in front of her. That way, people can understand why other people do what they do. As a result, propositions are essential to the predication and explanation of behavior via propositional attitudes. Importantly, the explanatory role remains unimpaired even if a person chooses not to take the glass despite being thirsty. In that case, people can infer that the person perhaps believed the glass was not hers, so that it would not be appropriate for her to drink from it, or perhaps that she is worried somebody might try to poison her.

In view of these roles, Schiffer then shows that classical propositions are crucial in that they establish what the world is like given what people believe; what people believe given what the world is like; and why people believe and do what they do. All of this is familiar and rather uncontroversial, and can go unchallenged. The crucial assumption to call into question instead is Schiffer's assumption that these roles require propositions to be contents rather than entities with content. To do so, it has to be shown that Schiffer at best establishes that both propositions and content are necessary, but that nothing requires propositions to be contents. If so, the alternative approach that does not identify propositions with content remains viable as well, without having to reject any of the roles accorded to propositions by Schiffer and many others.

How can it be shown that propositions as content bearers can play the roles of classical propositions? Starting with the information-acquisition role, the fundamental assumption that is needed is that beliefs are primarily relations to Language of Thought sentences, which, crucially, are type-individuated by their semantic content. More specifically, the view is that in the ascription of propositional attitudes, people attribute to others a token of a specific Language of Thought sentence type. For instance, when they ascribe to someone the belief that John is happy, they ascribe to that person a believing attitude towards a token of the Language of Thought sentence type JOHN IS HAPPY. However, since the type-identity of Language of Thought sentence tokens is determined by the semantic content of the tokens, this means that by ascribing to others a type of content bearer, people ipso fact ascribe to them the semantic content associated with that type. That way, an ascription of a proposition in the bearer sense is intrinsically linked to the ascription of a semantic content, even if the entity ascribed is not itself a content. The reason is that the entity that is the basis of the ascription only counts as being of the type ascribed in virtue of having

a specific semantic content. Hence, when a person knows what another believes, in the first place he or she "only" knows which structured content bearer constitutes the belief. However, the person thereby ipso fact knows its content as well, since the bearer can only be properly individuated by its content. So even if propositions are not themselves contents on this view, taking a belief to be a relation to such a proposition still establishes a necessary connection to a content, given that propositions are intrinsically content bearers. That way, even propositions as content bearers establish the necessary connection between a belief and its content. This in turn ensures that it is always possible to derive what the world is like in case a belief is true, which is precisely what Schiffer's information-acquisition role requires. In sum, the information-acquisition role requires both a theory of propositions and a theory of semantic content, but it does not need the assumption that a theory of the former is at the same time a theory of the latter. Propositions with content are just as able to fulfill the information-acquisition role as propositions as contents. In either case, it is the content of a belief that is necessarily associated with a belief ascription that allows for the acquisition of information about the world[10].

The same point is true for the other roles of propositions as well. If propositions as content bearers are intrinsically tied to a semantic content, appealing to a proposition will necessarily invoke a specific semantic content and thus secure the crucial connection to the world. When a person's behavior is explained by means of a belief, for instance, the belief ascription will primarily involve a relation to a content bearer, but the content bearer will immediately indicate the content of the belief as well. That way, it is always possible to offer explanations of a person's behavior in view of the state of the world. Clearly, this point holds for the predictive role as well. In fact, it holds as a matter of general principle. What is essential for the roles Schiffer lists is a robust connection between propositional attitudes and semantic content, and not classical propositions. A robust connection is of course guaranteed on the classical account that identifies propositions with content, as it thereby links the attitudes directly to a semantic content, but the crucial point is that it is not necessary for propositions to play the roles described by Schiffer.

7.3.2.2 Against Propositions as Sentential Objects

A view that offers both structured propositions and a theory of content yet denies that the former is part of the latter is thus prima facie able to account for the roles assigned to classical propositions. Schiffer, while not explicitly raising the issue about the relation between propositions and content, asks:

> "Could things other than propositions - say, sentential entities of some kind, such as public language sentence tokens or formulae in a language of thought - play those roles as well as propositions?"
> (Schiffer 2011: 4)

[10] In the same vein, Hofweber makes the following observation about propositional attitude ascriptions: "If that-clauses in belief ascriptions don't refer [to propositions-as-contents] then what do they do? The easy answer is that instead of referring to something which is the content of the belief, they merely specify what the content of the belief is. Saying what the content of a belief is can be done without referring to a content." (Hofweber 2007: 18). On the current proposal, ascriptions refer to (or rather denote) propositions as content bearers, thereby specifying a content without referring to one. As a reminder, this is not a psychological claim about what people think they do when they ascribe beliefs, or how they do so linguistically in terms of the semantics of propositional attitude ascriptions in natural languages.

Since propositions are sentences in the Language of Thought on the current approach, Schiffer here directly considers and dismisses the proposed view. The problem, however, is that Schiffer does so on the basis of an assumption rejected here, which is that such a proposal does not involve any notion of semantic content at all. The apparent reason for this is that Schiffer is so deeply committed to the view that propositions are contents that for him any view that proposes to do without classical propositions just is a view that proposes to do without content. Schiffer thus assumes that giving up on classical propositions is to give up on content altogether. That, however, is not the proposal offered here. The idea here is rather to deny the existence of classical propositions but to retain both propositions and semantic content, the former as content bearers and the latter as a semantic property of those content bearers. In fact, the very suggestion that propositions are bearers of semantic content already implies that there is a fundamental role for the notion of semantic content.

How does the aforementioned assumption figure in Schiffer's argument? It appears implicitly in Schiffer's discussion of the view on which belief ascriptions relate believers with the syntactically structured mental representations in their heads, which are sentences in the Language of Thought, in that Schiffer assumes that these sentence must then be individuated functionally (2011: 5). Presumably, Schiffer takes the assumption of functional individuation to be warranted based on the mistaken belief that appealing to content would be to appeal to classical propositions, thus undermining the attempt to do without them. That way, Schiffer assumes that any alternative to the classical conception of propositions must do without appealing to head-world relations, as these are explained by appeal to a notion of semantic content for mental vehicles. Schiffer then argues that mental vehicles without semantic content do not give the ascribers of beliefs enough:

> "Would [the ascribers] thereby ipso facto have enough to begin systematically exploiting the now accessible functional states of humans as evidence of what extra-cranial states of affairs obtain? No."
> (Schiffer 2011: 5)

What is missing is precisely a relation between beliefs and mind-external state of affairs. In other words, what is missing is a notion of content that allows beliefs and other propositional attitudes to be related to the external world. Subsequently, Schiffer argues that classical propositions are sufficient to establish head-world relations. Once they are posited, there is the required connection between mental states and extra-cranial states of affairs. The most plausible reason for this is that the classical theory of propositions actually is a theory of semantic content. What Schiffer dismisses here, however, is a view that has only content bearers without content. Such a view assumes vehicles of content instead of content, whereas the current proposal posits propositions as vehicles with content. It accepts the need for both propositions and content, it only rejects the idea that they are identical. The only way then to show that a view without propositions must be a view without content is to establish that propositions are contents. This is possible either by simply assuming that propositions must be contents, which is of course question-begging, or by arguing that any proper theory of semantic content must assume classical propositions. Schiffer provides no argument to that effect, however. As a result, nothing Schiffer establishes in fact undermines a view that rejects the identification of propositions and content. Hence, Schiffer has no case against the sentential approach offered here, as it does not share his crucial assumption that these sentences must be individuated non-semantically. And as mentioned, it can readily be granted that classical

propositions are sufficient to account for the roles Schiffer describes, as the key point is that they are necessary. It follows that Schiffer provides no convincing reasons to discard the view on which propositions are bearers of semantic content.

Schiffer subsequently offers a more detailed three-step argument against a sentential approach (2011: 8):

(6) Reference is necessary to determine what a sentence is about.

(7) Reference requires the act of referring, which in turn requires intentions to refer.

(8) Intentions are propositional attitudes, and so require classical propositions.

If correct, the argument establishes that sentential approaches need classical propositions, which would entail that they cannot replace the classical account. (6) is uncontroversial. (7), in contrast, is already much less evident. On a Language of Thought based approach to the mind, basic singular concepts are taken to refer without there being a referring intention involving them. One might wonder how a concept can refer to something without a corresponding intention, but a reasonable counter-question is how one can intend to refer to something without the use of a singular concept that refers to it. This question can be bracketed, however, as the main problem is with (8). On the proposed account, propositional attitudes involve sentences in the Language of Thought, which have semantic content as a property. Prima facie, this does not appeal to classical propositions. So what is Schiffer's argument against that? Why accept (8)?

Schiffer's argument would be valid if he could establish that any semantic theory requires classical propositions, which would mean that a semantic theory necessarily has to posit propositions as complex content entities to be ascribed to complex expressions. In that case, explaining propositional attitudes as relations to Language of Thought sentences would require classical propositions, and thus not represent a real alternative to the classical view. It is true that classical propositions are often presented as fundamental to account for the compositionality of semantic content, but they are not. Szabo makes the crucial observation that the classical view involves a metaphysical claim that goes beyond what is actually warranted by semantic considerations (2000). Specifically, the classical view is based on the optional idea that the content (reference) of the simple constituents is contained, in the sense of a part-whole relation, in the content (reference) of complex expressions. So if "Kripke" refers to Kripke, a sentence containing "Kripke" refers to a classical proposition that contains Kripke as a constituent. Szabo, however, calls what the names the "building principle" semantically unnecessary:

> "[T]he building principle requires something beyond compositionality. To say that the meaning of a complex expression is built up from other meanings implies - assuming the ordinary understanding of what it is to build up something from other things - that the meaning of a complex expression is a complex entity."
> (Szabó 2000: 489)[11]

Szabo argues that the additional commitment to complex content entities is sufficient but not necessary for compositionality. Szabo points out a possible alternative, which is to think of complex content as a complex property rather than a complex entity (Szabó 2000: 490). On Szabo's view,

[11] Meaning and content can be used interchangeably here.

complex content is determined by the contents of the basic constituents without containing them as parts. It follows that compositionality alone is not sufficient to establish the classical view of propositions. Therefore, Schiffer needs a further argument to support (8), which he fails to provide, however. Horwich makes a similar observation about compositionality and classical propositions:

> "It is much less controversial to suppose that sentences mean what they do because of what their words mean, than to suppose that sentences are associated with meaning entities which are constructed out of the meaning entities associated with words."
> (Horwich 1998: 159)

Hence:

> "for the sake of anyone who would baulk at such compositional meaning entities, it is important to see that our capacity to understand all the sentences in a language can be explained without invoking them."
> (Horwich 1998: 159)

The general point is the same. While the classical account is sufficient to account for semantic compositionality, which in turn explains how languages can be learned and understood, it is not necessary. It has to be necessary, however, for Schiffer's argument to be successful. As a result, Schiffer's argument in favor of classical propositions fails[12].

Incidentally, it should be clear by now why the difference between the current proposal and the classical view is not merely terminological about what to call "proposition", the structured content bearer or the structured entity that is its content. First of all, it is a substantial question about what entity plays the theoretical role accorded to proposition, the bearer or the content. Secondly, the suggestion here is that one should think of complex content as a complex property rather than a complex object (Szabó 2000: 496). Evidently, this represents a radically different view on the metaphysical nature of semantic content.

7.3.2.3 The Nature of Propositions

Schiffer argues for classical propositions on the basis of the theoretical roles propositions play, but also on the basis of the characteristics propositions must be taken have so they can play these roles. He offers the following set of criteria:

> "[P]ropositions: abstract, mind- and language-independent entities that have truth-conditions, and have their truth-conditions both essentially and absolutely"
> (Schiffer 2011: 3)

The aim in this subsection is to look at these characteristics in turn and to see whether propositions as content bearers have them. Schiffer is clearly correct in that it is standard practice in philosophy to subscribe to these criteria. The general point Schiffer wants to make is that the classical conception of propositions provides entities with precisely these characteristics. As before, there is no need to challenge that claim here, nor to call into question the list of characteristics as a whole. The more pertinent question is whether classical propositions are the only entities with

[12] Interestingly, Horwich still endorses the classical account: "I myself am happy to countenance compositional meaning entities." (Horwich 1998: 159).

these characteristics. More specifically, the question is which, if any, of these characterizations hinges on propositions being contents rather than content bearers. The answer to this question is ultimately that none does. The desirable characteristics do not require the standard view, they are just as well taken to be the attributes of propositions as mental vehicles of content.

The first property Schiffer attributes to propositions is abstractness, which entails that propositions are not concrete entities with a spatio-temporal location. Schiffer offers no principled motivation for the abstractness of propositions, but he provides the following common-sense observation:

> "That eating carrots improves eyesight is abstract: it has no spatial location, nor anything else that can make it a physical object."
> (Schiffer 2011: 3)

The intuitive idea is that propositions are not concrete, physical and perceptible objects. The question then is whether one has to adopt the classical view even if one accepts abstractness as a feature of propositions. Prima facie, the answer is no. Propositions as mental representation types are abstract objects as well. Like sets and numbers, they have no spatio-temporal location and they cannot be perceived. The same is not true for their tokens, however. They are concrete objects within the brains of thinkers, and so each token has a specific tempo-spatial location. As a consequence, the property of abstractness is restricted to propositions as types. The follow-up question then is whether the partial acceptance of abstractness is problematic. To answer that, it needs to be known why propositions are taken to be abstract objects in the first place. As far as intuition goes, there is no obvious difficulty in the assumption that propositions are abstract objects which have non-abstract physical tokens at the same time, as long as it is assumed that when one speaks of "the" proposition, as in "the" proposition that carrots improve eyesight, one speaks about the unique type without spatio-temporal location. Moreover, it is important to note that just because proposition tokens are concrete objects, it does not follow that one can perceive what proposition they are or whether they are true, say, as both content and truth remain imperceptible properties. This suggests that the proposed view is able to accommodate Schiffer's intuitive (if vague) requirement of abstractness for propositions, at least in the absence of any further reason to impose it as general condition for entities to be propositions. To defend the classical view in this regard, the proponent of the classical view would have to show that all propositions have to be abstract objects, but not in the sense that for every content there has to be an abstract proposition, as the current proposal can provide an abstract proposition type for each content. Rather, it would have to be shown that no concrete entity can be a proposition. Schiffer, though, provides no argument to suggest this is the case[13].

Schiffer's second characteristic is the mind- and language-independence of propositions. On the face of it, Schiffer thereby raises a question about the existence of propositions. Specifically, the question

[13] The type/token distinction is obviously very useful here, as it allows for different properties (abstractness and concreteness) to be ascribed to the same kind of object (propositions). Further advantages that are due the dual nature of propositions given the type/token distinction will emerge later in comparison to the approaches of King and Soames. Interestingly, it appears as though the type/token distinction is available only on the bearer view, as content does not come in abstract types with concrete tokens. This presumably requires argumentation, but it seems at least intuitively obvious. The type/token distinction can also be confusing, however. On the current proposal on which propositions are analogous to concepts as understood by Fodor (1998: 28), propositions come as types and tokens. Accordingly, it would be a confusion to ask: "But which ones are the propositions, really, the types or the tokens?", or correspondingly: "But really, are propositions abstract objects or not on this view?". Propositions as types are abstract, but as tokens they are concrete. See Glock (2009) for an example of such a confusion.

is whether there can be propositions in the absence of minds and/or languages. This question is prominent in the literature on propositions due to King's well-known view on which propositions require natural languages to exist, and hence language-using minds as well (King 2009: 259). This is widely considered a major difficulty for King's account, for instance because it problematically entails that people cannot believe things before they are able express them in a natural language (Deutsch 2008).

On the proposed view, the picture is again complicated by the type/token distinction. In terms of mind-independent existence, it is clear that proposition tokens are mind-dependent. Individual tokens cannot exist without the minds that realize them. However, for propositions as types, it is perhaps intuitive to assume that they can exist (perhaps in a different sense) even without tokens. A simple example shows why. For each natural number there can clearly be a proposition to the effect that that number is a number. The amount of possible propositions is thus infinite. However, it is obvious that the number of actual tokens must be finite. It follows that there are more possible types than tokens, which seems to suggest that proposition types must be able to exist without tokens. However, the fact that these propositions can exist does not mean that they do. Considerations of consistency raised in the previous chapter supported a Nominalist rather than a Platonic approach to types, and hence to propositions as types as well. If so, there are good reasons to assume that propositions as types do not really exist as ontologically independent objects. However, keeping in mind the crucial distinction between facts and true propositions, and that mind-independent truths are about facts rather than propositions, this does not, at least not prima facie, seem to be a defeating problem.

What about the language-independence of propositions? Clearly, this depends on whether the language is a natural language or the Language of Thought. Propositions are sentences in the Language of Thought on the current proposal, and hence they cannot exist without the existence of this mental language. The same is not true for natural languages, however. As a result, this commitment is different, and substantially less problematic, than King's. Since King refuses to subscribe to a Language of Thought hypothesis, he makes the existence of propositions conditional on the existence of natural languages. This is problematic as it means that natural languages cannot have come into existence in order to give expression to previously held beliefs, since the latter involve propositions which for King require a natural language to exist (Deutsch 2008). King's response to this problem is to maintain that propositions and natural languages come into existence at the same time (King 2009: 267). Even so, this still does not allow for the plausible idea that natural languages came into existence to give expression to thoughts that exist prior and independently. In contrast, the Language of Thought is commonly and plausibly taken to be independent of natural languages, and to have existed antecedently. This is simply to say that some of our ancestors were able to think without being able to speak. Accordingly, the current proposal has no difficulty to accommodate the fact that natural languages came into existence in order to allow thinkers to give expression to their thoughts. Moreover, as King makes access to propositions conditional on the mastery of a natural language, he controversially puts propositional activity beyond the reach of creatures that do not master a natural language such as small infants and non-human animals (Deutsch 2008). The proposed view, in contrast, does not face this exclusion problem, as propositional activity only requires syntactically structured mental representations, which infants and higher animals can possess even if they are unable to communicate in a natural language.

Hence, the current proposal does not problematically entail that propositions are dependent on natural languages. And while it does entail that propositions depend for their existence on a mental language, this seems unproblematic.

The next issue Schiffer raises are truth-conditions, which propositions have by general consensus. According to King, this actually undermines some views about the nature of propositions:

> "Propositions have truth-conditions: they are true or false, depending on how the world is. So if some ordered n-tuples are propositions, some ordered n-tuples have truth-conditions. But ordered n-tuples don't seem to be the kinds of things that have truth-conditions."
> (King 2008)

Hence, whatever one takes propositions to be, they must be the kind of things that can have truth-conditions. Does this mean that propositions have to be considered contents? In fact, on the classical view, propositions are the primary objects with truth-conditions. As propositions are the contents of declarative sentences, this means that the contents of sentences primarily have truth-conditions, and that sentences have them, if at all, only derivatively, by virtue of the fact that they express propositions. From the point of view of the current proposal, this actually appears much less natural than is commonly assumed. It is very natural to hold that sentences are true or false, and thus that they have truth-conditions as well, because of which they are true or false depending on the way the world is. It seems much less natural, though, to say that the contents of sentences are true or false. The oddness is presumably due to the fact that the content of a sentence is a property of that sentence, and not an object, and hence not the kind of thing to be true or false. More importantly, it is plausible to think that having truth-conditions is conditional on having meaning or content. This would explain why sentences can have truth-conditions but tables, say, or sets of objects cannot. In other words, it is plausible to maintain that sentences can have truth-conditions because they have semantic content, as content is necessary to specify the conditions under which a sentence is true or false. If that is correct, however, the claim that propositions have truth-conditions also suggests that they have rather than are content. So while propositions have truth-conditions by assumption, it is very plausible to assume that having truth-conditions is conditional on having meaning or semantic content. These two claims do not go together in the classical account, however, on which propositions have truth-conditions but are contents.

One way to consolidate both claims is to adopt a view on which propositions are content bearers instead. That way, propositions can have truth-conditions for much the same reason that sentences can have them, as they are essentially the same kind of semantic object, namely bearers of semantic content. Importantly, this is not to deny that sentences, and bearers of semantic content more generally, are true or false in virtue of their content (and the way the world is). The truth of sentences evidently depends on what they say about the world. The dependence of truth on content, however, does not mean that sentences are true or false in virtue of inheriting truth-conditions from their content. Rather, having truth-conditions is a property of bearers that depends on their content without being derived from that content. It is in fact obvious that being inherited is not the only way a property can be derived. The truth of sentences, for instance, is also partly derived from the way the world is, but the truth of sentences is evidently not a property that is inherited from the state of the world. Accordingly, it is possible, and arguably very plausible, to think that content and having truth-conditions are two closely connected properties possessed by one and the same

object, namely the bearer of content. This contrasts with the classical view, on which one property, namely having truth-conditions, is effectively shared by two distinct objects, namely the bearer of content and the content itself, which is the classical proposition.

At this point, it is imperative to address a possible worry for the proposed account in view of quantification in the context of propositional attitudes. It is often assumed that classical propositions are required to make sense of sentences such as "everything John believes (or said) is true", as only classical propositions can provide the objects quantified over. While the current proposal rejects most of Schiffer's arguments by retaining a theory of content, the defense in this context is the fact that it retains a theory of propositions as objects over which quantification is possible. The fundamental difference then is that quantification is over content bearers rather than contents. That, however, is expected given that propositions as bearers are considered the objects that are believed and true as well, which renders them the objects that should be quantified over in such cases. A sentence such as "John believes everything Mary believes", then, is roughly to be analyzed as true if all propositions types that have a token that constitutes a belief of Mary also have a token that constitutes a belief of John. It is important to stress that this analysis must make use of a relatively weak notion of constitution, so that a sentence such as "Mary fears what John knows, namely that Peter is home" can be roughly analyzed as being true if there is a proposition type to the effect that Peter is home that has one token that is constitutive of John's knowledge and another that is constitutive of Mary's fear. Evidently, a proposition token being constitutive of someone's fear in this way is different from its being the object of the fear, which is why fearing that Peter is home is not the same as fearing the proposition to that effect (Moltmann 2003: 82). While this brief note does of course not provide a conclusive analysis of quantification in the context of propositional attitudes, it does prima facie suggest that the proposed account is able to accommodate it.

A final constraint Schiffer imposes on any acceptable account is that propositions must have their truth-conditions both essentially and absolutely. This contrasts with natural language sentences, the meaning of which is both contingent and relative. It is relative to, and so can change with, the use speakers make of them (Schiffer 2011: 3). This constraint is again met by propositions as types on the current proposal. On the proposed view, tokens are type-individuated by their semantic content. This shared content is therefore the content associated essentially with the type as well. One can consider two KRIPKE token concepts as an example. Both tokens refer to Kripke, and (partly) in virtue of that, they belong to the same type, which in that sense has to be taken to refer to Kripke as well[14]. Having a given reference is thus constitutive of a referring concept type. If its reference were different, it would not be the type it is. That way, the situation for types is analogous to numbers. The number 5 is essentially the successor of 4, it is what makes 5 the number it is. Hence, the number 5 could not fail to be the successor of 4, even if the numeral "5" could of course be used to refer to a different number. Similarly, the type KRIPKE could not fail to refer to Kripke, even if "KRIPKE" could be used to refer to a different type with a different reference. As a result, reference is essential to referring concept types. Since this fact does not depend on the specific nature of semantic content, but rather depends on the general principle that tokens are type-individuated by their semantic content, it follows that semantic content is generally constitutive of concept types. By reason of compositionality, the content of proposition types is in turn fully determined by their syntactic structure and the content of the concept types

[14] Coordination is also required for type-identity, but coordination only holds between tokens, and is irrelevant for types. If the tokens are referential, the corresponding concept types are thus purely referential.

they contain. Since syntactic structure is reasonably constitutive of proposition types in much the same way that reference is for concept types, their overall semantic content is also constitutive of proposition types. That way, the content, and hence the truth-conditions, of propositions as types are essential and absolute. Hence, a type of proposition as content bearer has its truth-conditions both essentially and absolutely, as required by Schiffer.

The same is evidently not necessarily true for proposition tokens. Due to the multiple realizability of content, it has to be assumed that there is no intrinsic connection between a certain physical entity in the brain and a given semantic content. It may thus seem, problematically, that the truth-conditions of propositions as tokens are neither essential nor absolute. However, it is important to keep the de re/de dicto in mind here. While it is true that as objects, or tokens de re, content is not essential to concept and proposition tokens, as tokens of a given type, or tokens de dicto, content is essential. The physical objects in question would not be tokens of a given type if they had different content, given that their type-identity is determined by their semantic content. Hence, while content is not constitutive of proposition tokens as objects, as required by the multiple realizability of content, it is for propositions as tokens, as required by Schiffer. As a result, propositions as tokens as well as types have their truth-conditions both essentially and absolutely.

In conclusion, neither the roles nor the characteristics of propositions described by Schiffer seem to undermine the proposal that they are content bearers, which thus remains a viable proposal. Having established that such a view is possible, the main concern next is to ascertain whether it is preferable as well.

7.3.3 Propositions as Bearers of Semantic Content

Before offering reasons for the view that propositions are mental bearers of content, first a brief overview of the different options considered in this section. A well-known classical view is due to Frege. For Frege, sentences express what he calls thoughts. These thoughts are the senses of sentences (Frege 1918: 61). The constituents of Fregean thoughts are the senses of the constituents of the sentences that expresses them. Both senses and thoughts are abstract objects for Frege, which exist in a third realm (Frege 1918: 69). However, most contemporary philosophers of language prefer the Russellian conception of propositions instead. For Russell, sentences express propositions. These Russellian propositions contain the objects the sentences are about as constituents, they are literally part of the proposition (McGrath 2008). As a result, sentences such as "Phosphorus is a star" and "Hesperus is a star" express the same Russellian proposition, as they have the same object, Venus, as constituents. In contrast, they express different Fregean thoughts, as the two proper names for Venus have different senses even if they are co-referential. When philosophers such as King and Soames speak of classical propositions, they generally mean propositions as understood by Russell.

Two recent conceptions of propositions also relevant here are the proposals of Soames and King. On Soames' cognitive-realist account, propositions are event types of cognitive predication (Soames 2010d: 103). Roughly, for Soames the proposition that John is happy is the event type of cognitively predicating happiness of John. For King, propositions are facts rather than events. He offers the following definition:

> "[T]he proposition that Michael swims is the fact consisting of Michael and the property of swimming standing in the [following] two-place relation [...]: there is a context c such that Michael is the semantic value in c of a lexical item e of some language L and the property of swimming is the semantic value in c of a lexical item e' of L such that e occurs at the left terminal node of the sentential relation R that in L encodes ascription and e' occurs at R's right terminal node."
> (King 2012: 5)

For King, propositions are roughly facts about the existence of natural language sentences that are interpreted in a way that they predicate some relevant property of a given object[15].

For the sake of completeness, the conception of propositions offered in this thesis can be included here as well. On the current proposal, propositions are objects rather than facts or events. More specifically, they are syntactically structured mental representations, which are sentences in the Language of Thought. As an example, one can consider the natural language sentence (SF) shown below (9). (SF) renders the surface form, which is how a sentence appears in a natural language such as English. (DF) offers the corresponding deep form, which represents a possible structure of the underlying Language of Thought sentence, using, by way of illustration, the event-based semantic analysis proposed by Pietroski (2005). Finally, (IF) shows a possible way in which (DF) can be implemented, on the basis of a (random) fixed 5-bit architecture, which is used again purely for the sake of illustration:

(9) John stabbed Peter in the hall with a knife (SF)

(10) $\exists Xe(Agent(e; JOHN)\&PastSTAB(e)\&Theme(e; PETER)\&In(e; HALL)$
$\&With(e; KNIFE))(DF)$

(11) 000010010100011001000001100101001100011101000010010101001011011000001100101
010000100101101000110010100110011100100001001011110001100101010000100110000
000110010100110100010100001001100100001100101001101001101000010000 (IF)[16]

On the proposed view, a proposition type has a structure as shown in (DF), while its tokens are physical realizations of a sequence of binary signals as exemplified by (IF). Evidently, the view is not committed to any specific theory about the structure of the deep form or its possible computational implementation, only to the very general idea that propositions are sentences in the Language of Thought that represent the deep form employed by language users in their interpretation of natural language sentences. The specific example above is provided only to illustrate the general take on the nature and structure of propositions on the current proposal[17].

[15] Another option that was briefly mentioned is that propositions are acts, which is due to Hanks: "[T]he proposition expressed by a declarative sentence is a certain type of action a speaker performs in uttering that sentence." (Hanks 2011: 11).

[16] "∃": 00001, "(": 00011, "Agent": 00100, "e": 00101, ",:" 00110, "JOHN": 00111, ")": 01000, "&" :01001, "Past": 01010, "_": 01011, "STAB": 01100, "Theme": 01101, "PETER": 01110, "QUIET": 01111, "In": 10000, "HALL": 10001, "With": 10010, "KNIFE": 10011.

[17] A deep form such as (DF) contains referring symbols such as "JOHN" as well as non-referring symbols such as "[" and "&". All these symbols are mental representations, but only the former are concepts, which are individuated by their content (reference and coordination). The latter are individuated by their functional role instead. Type-identity over and above sameness of functional role is in fact the hallmark for a mental representation to be a concept, the reason being that concepts have correlates that appear in the surface form, which is why their functional role can be overridden by their role in communication, as explained in earlier chapters.

The remainder of this section aims to motivate the view that propositions are mental representational bearers of semantic content. To begin with, a few very general considerations in favor of the view are given, before considering in more detail how it avoids some of the specific worries raised for the alternative ideas. The first motivation, already mentioned, is the analogy with concepts. Some contemporary philosophers adopt a Fregean conception of concepts on which they are abstract content entities expressed by linguistic expressions. However, most contemporary philosophers prefer to think of concepts as mental representations. A nice feature of that approach is that it has many supporters outside of philosophy as well, most notably in psychology, linguistics and cognitive science. As a result, the mental conception of concepts allows the philosophically important notion of a concept back into the fold of the wider scientific community. A very general motivation for the current proposal is therefore to achieve the same for propositions. To be sure, this is not to suggest that philosophy is not entitled to its proprietary notions, but it should be considered an advantage if a theory is philosophically convincing while at the same time being consistent with the theoretical approach followed by the wider scientific community.

Secondly, there is certain theoretical modesty to the proposed account. In a way, the classical approach oversteps the mark both semantically and metaphysically. An example of this is that it posits objectified contents and so has to assign syntactic structure to two distinct entities, the content bearers and their content, unlike the current proposal. Another example concerns compositionality. As pointed out by Szabo earlier, the classical view, which has propositions contain other objects as parts, incurs a metaphysical commitment beyond what is semantically mandated. What is required from the point of view of semantic theory is that complex content is determined by the content of the basic constituents. If these basic constituents are referential, as in the case of proper names, then their semantic content will consist in the reference to objects. Hence, these objects have to be part of what determines complex content, but that does not warrant the assumption that they are a mereological part of the complex content. A plausible alternative is to think that complex content is a property determined by the objects referred to without literally containing them. In both cases, classical propositions incur commitments that are not fully motivated by semantic consideration, and so appear dispensable from a theoretical point of view.

Thirdly, there is a related point of showing restraint in drawing metaphysical conclusions from semantic premises. Fine has a nice negative example in this regard in Frege's view that the truth of a sentence consist in the reference of a sentence to an object, "the True", in analogy to the way that proper names refer to objects (Fine 2010b: 72). That way, Frege turns truth, which is intuitively a property sentences have if they are true (just as an object has the property of redness if it is red) into an object to which sentences refer. Frege thus dubiously draws the metaphysical conclusion that there is an object "the True" by justifying it on the basis of semantic considerations. A similar motivation for the current view is that it is equally mistaken to think of complex content in such a way by turning it into a complex object, the classical proposition, to which the sentence as a whole stands in a semantic relation analogous to reference. To be sure, such a view offers a certain degree of theoretical unity, as it allows prima facie very different semantic phenomena to be treated the same way by the semantic theory. It is nevertheless both semantically and metaphysically highly questionable, as a convincing theory should not treat phenomena equal if they are in fact distinct.

Besides these very general considerations, the proposed conception of propositions also avoids some of the difficulties that beset the classical account. The first advantage in this regard concerns the

cognitive access thinkers are supposed to have to propositions. An analogy with concepts is helpful to make this point. A major motivation for Fodor, who is a main advocate of the view that concepts are mental representation, for thinking that concepts are mental entities is the difficulty he sees for providing a plausible explanation of the epistemic access thinkers have to concepts otherwise, for instance if they are understood as Fregean abstract objects in a third realm. Fodor thus effectively raises a naturalistic worry for concepts, based on the question how the cognitive access thinkers are supposed to have to senses and thoughts as understood by Frege can be explained in naturalistically acceptable terms (Fodor 2008: 52). Evidently, the same worry arises for the complex correlates of concepts as well, whether they are Fregean thoughts or Russellian propositions. How do such entities, and the cognitive access thinkers have to them, fit into a naturalistic world-view?

This difficulty has not gone unnoticed in the literature. King, for instance, even though he does not level this criticism explicitly at the classical accounts, does so implicitly by going to great lengths to argue that his proposal does not face this problem (King 2012: 8-10). At any rate, given the analogy between concepts and propositions on the view proposed here, it is possible to provide the same response for propositions that Fodor offers for concepts. Fodor's basic suggestion is to think of concepts primarily as mental representation tokens rather than abstract extra-mental objects. Concepts as mental representation tokens are cognitively accessed simply by being instantiated in the brain. On the current view, the same is true for propositions as well. Proposition tokens are physical structures in the brain that can be cognitively accessed by being instantiated. As mental particulars tokened in the brains of thinkers, propositions are thus both naturalistically and epistemically unproblematic, given that they are no longer platonic mind-external objects. That way, propositions and the cognitive access to them are straightforwardly compatible with naturalism. However, granted that this is true for proposition tokens, what about the corresponding abstract and mind-external types? Fortunately, there is no similar problem of cognitively accessing proposition types. The reason is that accessing a type is just short for instantiating a token of that type. Hence, there is no theoretical pressure to assume cognitive access to abstract types in the way that there must be to mind-external abstract Fregean thoughts.

Another well-known issue in propositional theory is Benacerraf's problem. Benacerraf's original problem concerns mathematical objects such as numbers, but it applies, mutatis mutandis, to propositions as well:

> "In his paper 'What Numbers Could Not Be' Paul Benacerraf argued that numbers cannot be reduced to sets because there is no principled reason for choosing between the many equally good ways of carrying out such a reduction. It has recently been noticed that the same problem applies to reductions of propositions. The problem arises in stark form for Russellian theories that identify propositions with ordered sets of objects, properties and relations."
> (Hanks 2009: 473)

Bontly makes the same point:

> "Structured propositions are often represented as ordered n-tuples of constituents [...] Since there is no principled ground to identify the proposition with one rather than another of these constructions, it cannot be any of them."
> (Bontly 2009: 365)

This problem is widely considered a major stumbling block for the classical view. It is therefore a notable advantage of the current proposal that it avoids it. How so?

For tokens, the problem simply does not arise, as their structure is not arbitrary but a determinate matter of empirical fact. There is an obvious reason why Benacerraf's problem affects abstract objects like numbers but not concrete objects, like individual zebras, say, the structure of which is a matter of empirical fact. Propositions as types, in contrast, are abstract objects. Even so, Benacerraf's problem is not a concern, as it is plausible to maintain that propositions as types inherit the determinate structure tokens have as a matter of empirical fact. The derived structure of proposition types in fact harks back to the fact that semantic content determines type-identity. Just as concept types represent a group of tokens with the same semantic content, proposition types similarly group Language of Thought sentence tokens with the same complex semantic content, which, crucially, entails that all these tokens share a syntactic structure. That way, proposition types share that structure as well. Structure is therefore not arbitrarily assigned to types, but uniquely determined by the syntactic structure the tokens have as a matter of empirical fact. As a result, there is no Benacerraf problem even for the abstract proposition types. The underlying reason is that abstract proposition types have concrete tokens, and hence they are empirically grounded in a way that classical propositions are not.

As King points out, Soames uses a similar type/token based strategy to defend his claim that propositions as event types have truth-conditions (King 2012: 21). King challenges this strategy, however, asking Soames to specify why the proposition as type is taken to inherit the truth-conditions of the tokens, since:

> "there are clearly properties had by all event tokens of a given event type that are not properties of the type"
> (King 2012: 21)

Setting aside the specifics of Soames' view and King's argument against it, it is evident that the same worry extends to the current proposal as well, as it claims that the structure of propositions as types is inherited from the structure of its concrete tokens.

Clearly, King's worry is not whether types can inherit properties from their tokens at all. He does not object to that. His challenge is rather to say what determines that some properties are inherited but others are not. In other words, his challenge is to provide systematic principle to determine which properties are inherited and which are not so as to avoid making the response ad hoc by selectively picking the required properties. A response that immediately suggests itself is to exclude from the types all the properties that are not universally shared by the tokens. The corresponding principle would state that properties are inherited by the types if they are shared by all their tokens. This would exclude spatio-temporal location and physical shape but retain syntactic structure, as required. As King already notes, however, this does not work, for instance because it does not exclude the property of having a spatio-temporal location, which all tokens have, but types do not (King 2012: 21). It also leads to problems for types with a unique token, or even with more tokens if these happen to share an expendable feature by sheer coincidence. A much more promising response is therefore to restrict inheritance to all and only the content-essential properties. Syntactic structure for instance determines content but spatio-temporal location does not. That way, universally shared properties that are semantically irrelevant are systematically

excluded. The principle is motivated by the fact that the theoretical purpose of types is precisely to embody what is identical to tokens insofar as it is semantically relevant. It is justified, in turn, by the fact that tokens are type-individuated by their semantic content. Even without all the details, this response prima facie shows that King's challenge can be met.

The next perceived difficulty with classical accounts of propositions concerns the representational nature of propositions. The question raised by many philosophers is how classical propositions (or Fregean thoughts) get to represent things as being a certain way. For instance, how does a Fregean sense get to represent its object, and related to that, how does a Fregean thought get to represent a given object as being a certain way? Soames and King in fact agree that the classical view gets things the wrong way around when explaining the representational capacities of thinkers as hailing from their relation to classical propositions, which are considered structures that are inherently representational. Thus King:

> "[There is a view] according to which propositions by their very natures and independently of all minds and languages represent the world as being a certain way and so have truth-conditions. Though this is part of how propositions have been classically conceived, I cannot accept that propositions are like this. I find this idea unacceptable [...] I just can't see how propositions or anything else could represent the world as being a certain way by their very natures and independently of minds and languages."
> (King 2009: 259-260)[18]

Soames agrees with King, and hence proposes to found the representationality of propositions on the mental states of thinkers:

> "Propositions, as I understand them [...] are not the source of that which is representational in mind and language. Sentences, utterances, and mental states are not representational because of the relations they bear to inherently representational propositions. Rather, propositions are representational because of the relations they bear to inherently representational mental states and cognitive acts of agents."
> (Soames 2010d: 7)[19]

The basic response both Soames and King provide is to accord representational primacy to the mind instead, thus rejecting the classical idea that propositions as mind-independent objects represent prior to, and so independent of, representational minds. The current proposal on which propositions are structured mental representations allows for a similar response. On the proposed view, there is no representationality prior to, and independent of, the representing mind either. Even so, proposition tokens are still considered inherently representational, which is what King objects to, but the crucial difference is that propositions are not mind-independently representational on the proposed view. Propositions as mental representations are not inherently representational mind-external objects that explain why the mind is representational, they are rather part of the inherently representational mind. In contrast to Soames, who seems to suggest in the quote above that minds are causally responsible for the representational nature of propositions, however, there is no causality involved. As propositions are part of the mind, their representationality is not caused by the representational activity of the mind, propositions are rather constitutive of that very activity.

[18] See also (King 2012: 17).
[19] See also (Soames 2010d: 107).

Hence, while the current proposal accepts the representational primacy of the mind, it accords that primacy to propositions as well, as it takes the latter to be a part of the former. That way, it also offers a specific proposal as to what part of the mind represents (concepts and propositions) and how it do so (by virtue of having semantic content), which neither King nor Soames offer. It does so, however, without mistakenly reverting to the classical order of explanation[20].

A related issue is to explain why propositions represent. This issue is known in the literature as the unity of the proposition problem, which calls on any adequate theory of propositions to explain the difference between a representational proposition and a non-representational list of its constituents (King 2012: 2). Evidently, this issue has to be addressed whether propositions are considered concrete or abstract objects, but the answers that can be provided are potentially different. In contrast to the classical account, on the current proposal it is possible to maintain that proposition tokens represent as a matter of empirical fact. In other words, the view is that it is an empirical fact about the world that it contains minds that represent by means of propositions. Therefore, to ask why propositions represent is akin to asking about the emergence of other biological facts, which will elicit a similar response, presumably based on evolutionary principles[21]. Moreover, there is an additional question as to why propositions represent the way they do[22]. King introduces a language called "Nenglish" to ask for an explanation of why the proposition that John is happy, say, represents John as being happy rather than representing him as not being happy (2007: 35). On the current proposal, this question receives a similar answer. Proposition tokens both represent and represent the way they do as a matter of empirical fact, while the abstract types incorporate these facts about their tokens by design. The point is thus that sentence tokens in the Language of Thought just do not, as a matter of empirical fact, represent the way Nenglish tokens do. That is not to say, however, that a positive proposition must be syntactically simpler than its negative correlate, which is the case if the latter has the former as a proper constituent. It can also be the other way around. Both options are empirically possible, but the crucial point is that the correct view is a determinate matter of empirical fact[23].

On the current proposal, the representationality of propositions is thus due to the fact that proposition tokens are concrete entities that are part of the mind which represent as a matter of empirical fact. This view partially coincides with Soames' proposal, which King criticizes as follows:

> "The claim that the event tokens in question inherently have truth-conditions is just mysterious. I can see how event tokens could have truth-conditions in virtue of agents interpreting them in certain ways. But how could an event token inherently have truth-

[20] On should note that a physical copy of a proposition token outside a mind would not be representational, but that does not show the representational primacy of mind over propositions, as the copy would not be a proposition. Physical identity is neither sufficient nor necessary for type-identity. As a result, the copy would be the same type of object, but not the same type of proposition.

[21] Roughly, minds contain representational propositional structures because it is advantageous for their survival that they are able to represent the world as being a certain way.

[22] Fine (PC).

[23] The explanation again appeals fundamentally to the principle of content-essential property inheritance. Also, as both Soames and King argue, the representational character is taken to address the real unity-of-the-proposition problem. The question as to what keeps the constituents of the proposition together is really about what makes them represent and represent the way they do. Beyond that, the question what keeps propositions together, as complex entities, requires the same answer as any other complex entity, be they concrete like zebras or abstract like sets. The unity question thus divides into a specific question about the representational nature of propositions and a more general question about the unity of complex entities in general, and a theory of propositions specifically has to answer only the first.

> conditions? How could an event token have truth-conditions by its very nature? That seems as mysterious as the claim that propositions are sui generis abstract entities that have truth-conditions by their natures and independently of minds and languages, which I and Soames himself both reject as unintelligible."
> (King 2012: 20)

To begin with, it is important to note that the proposed view here differs in that it takes propositions to be objects rather than events, so any worry King might have about the ontological category to which Soames thinks propositions belong is immaterial at this point[24]. There is a similar problem, however, of proposition tokens being inherently representational despite not being interpreted. It is not clear, though, why King thinks this is a problem. Propositions as understood here are neither abstract nor are they supposed to represent independently of minds and languages. In fact, token propositions are concrete objects that are dependent on both a mind and a language, namely the Language of Thought. Proposition tokens are thus taken to represent by their very nature, but only because that nature is both mental and linguistic. Moreover, there is even a good explanation of why they represent the way they do.

In addition, the response King deems necessary to deal with this perceived difficulty is not without problems either. King holds that propositions have truth-conditions, and thus represent, by virtue of being interpreted:

> "To summarize, [the proposition that Michael swims] has truth-conditions because speakers interpret its propositional relation as ascribing the property of swimming to Michael."
> (King 2012: 10)

However, propositions are not usually considered to be the kinds of object that themselves stand in need of interpretation. A major reason is that it raises a tricky question about what interpretation is. Interpretation is generally taken to consist in the correct association of interpretable expressions with their meaning or semantic content, which for sententially structured entities is a proposition, at least on King's view. Yet if this is King's view, there is an obvious circularity in his account. If propositions need interpretation, but interpretation consists in the association with propositions, King's explanation of why propositions represent fails, as it presupposes an answer to it. If this is not King's view, however, then it is not clear what interpretation is for King, especially with regard to propositions. Hence, on the face of it, King proposes to account for the representational nature of propositions on the basis of interpretation but without offering a good explanation of what interpretation is. Furthermore, it is reasonable to be generally skeptical about any view that is predicated on the interpretation of contents rather than of entities that have content. In contrast, these problems do not arise on the current proposal. There is no dubious interpretation of content nor circularity in the explanation. Despite being a language, the Language of Thought does not stand in need of interpretation as it is inherently representational. This in turn allows for a non-circular explanation of the interpretation of other content bearers, most notably natural language sentences. Interpretation consists in their association with propositions, which are mental representations that provide the adequate content. This means that natural language sentences are understood by being "translated" or "transmitted" into the Language of Thought. In this respect,

[24] More about this later.

the proposal seems more promising than what King offers.

Thus far, this section has been concerned mostly with the advantages the proposed account has over the classical account of propositions, which it shares with the recent proposals offered by Soames and King. However, the last paragraph already indicated that the proposal has advantages over these recent proposals as well, which are the topic of the remainder of this section. The two main points of difference in this respect are Frege's Puzzle and the objective nature of propositions.

Frege's Puzzle is obviously relevant for propositional theory. After all, it is the reason why Frege and others have rejected Russell's conception of propositions. As indicated already, the main problem is that on Russel's view, a propositions about Hesperus is identical to a similar proposition about Phosphorus, which, however, is inadequate for many explanatory purposes, especially in linguistics and psychology. In spite of that, neither Soames nor King really address Frege's Puzzle. Both have to face it at some point, though, and it is not at all obvious that they can successfully do so. In the present context, the familiar challenge is to explain how the belief that Hesperus is a star differs from the belief that Phosphorus is. Frege answers this challenge by maintaining that the beliefs are relations to distinct Fregean thoughts, due to the fact that the senses associated with Hesperus and Phosphorus are different. On the current proposal, the beliefs are also relations to different propositions, since propositions are type-individuated by more than just their reference. Because of the underlying Relationist semantics, the proposed conception of propositions as mental representations is thus able to address Frege's Puzzle, much like Frege's sense theory[25].

What about the alternative proposals? For Soames, propositions are events of predication. Soames primarily individuates these predication events by what they are about, so that the question arises how he can distinguish between different predications made of the same object under different guises (2010d: 124). In other words, what marks the distinction between the event type that is the predication of being a star to Hesperus from the event type that makes same predication of Phosphorus? As it turns out, Soames raises this general question but then addresses only the easier versions of the Puzzle. He points out that he can explain the difference between the proposition that two is a number and the propositions that the square root of four is a number (2010d: 111). The reason is that the latter involves a complex event of referring to the number two, as it involves both reference to four and the square root function, which is not the case when reference to the number two is made directly. Unfortunately, this convenient difference in the complexity of co-referential expressions is not present in the general case. Evidently, it cannot be used to mark the difference between beliefs about Hesperus and beliefs about Phosphorus. These less accommodating cases Soames simply fails to address. It is clear, however, that Frege's Puzzle is not solved by solving only its easier variants.

Moreover, an adequate solution to the problem seems particularly elusive for Soames, as he rejects anything like the Language of Thought as "fantasy" (2010d: 8). As a result, Soames is unable to specify what cognitive predication is, and he is even less able to say how it can involve the same object under different guises. Soames' theory of propositions thus fails to properly distinguish co-referential beliefs. In contrast, the current proposal is specific about what cognitive predication is, namely the tokening of a proposition with a given content. For instance, predicating the property of being a star to Hesperus is to token the proposition that Hesperus is a star. Moreover, it can

[25] As argued earlier, a Fregean sense theory fails for Kripke's variant of the Puzzle, though, unlike the Relationist alternative.

explain how such a predication differs from a similar predication made about the same object under a different guise, as the proposition that Phosphorus is a star is different from the proposition that Hesperus is a star. Unlike Soames, the current proposal is able to address Frege's Puzzle for belief.

What about King's view that propositions are facts of some sort? King does not really address the issue either:

> "King has missed the opportunity to defend his view by showing that it has a way of dealing with Frege's Puzzle."
> (Deutsch 2008)

Prima facie, it is hard to see how King's fact-based view can distinguish the proposition that Hesperus is a star from the proposition that Phosphorus is. Plausibly, the identity conditions of facts are such that they are identical if the objects in them are identical, which is to say that facts about Hesperus are identical to the corresponding facts about Phosphorus. It seems evident that because Hesperus is Phosphorus, the fact that Hesperus is a planet is the same as the fact that Phosphorus is. The problem for King then is that on his view the proposition that Hesperus is planet is a fact, part of which is about Hesperus being the semantic value of some expression in some language (King 2012: 5). Yet by the identity conditions of facts, this is identical to the corresponding fact which has Phosphorus as that semantic value. As a result, on King's approach propositions about Hesperus will be identical to propositions about Phosphorus.

Even though King shows strong tendencies towards a Russellian conception of propositions, he is officially neutral between Frege and Russell (King 2008). He therefore leaves it open what the semantic values of proper names ultimately are, whether they are actual objects, as Russell claims, or a mode of presentation of these objects, as Frege believes. King's proposal on propositions as facts inspired by Frege is presumably based on the idea that not just Hesperus is the semantic value of some expression in the fact that is the proposition, but both Hesperus and the sense of "Hesperus" (King 2012: 12). If so, this will distinguish propositions about Hesperus and Phosphorus. Since the senses of "Hesperus" and "Phosphorus" are distinct objects, the facts about them are different as well, and so are the propositions that are such facts.

If that is King's Fregean proposal, however, he faces some of the problems mentioned earlier, especially with regard to the cognitive access people must be taken to have to abstract senses in a third realm. Perhaps King can address this worry by claiming that people grasp senses simply by using words that express them:

> "The most straightforward explanation of why speakers have cognitive connections to the facts that are propositions as soon as they deploy sentences of languages is that by deploying sentences of their languages they thereby have cognitive access to the relevant facts."
> (King 2012: 8)

This arguably raises as many questions as it answers, however. It is also highly doubtful that King can uphold the idea that propositions are naturalistically acceptable on his Fregean proposal, as he claims (2012: 11). The resulting theory is only as naturalistically acceptable as a theory of senses, which according to many is not very compatible with naturalism. There is no need to go further into these issues, though, for two reasons. First of all, King is simply not explicit about his

preferred response to Frege's Puzzle. Secondly, and more importantly, the next issue is much more problematic for King at any rate. Suffice it to say that the proposed conception of propositions as mental representations is much less mysterious in this regard. Co-referential propositions are different on this view if they comprise different concepts, which is the case if they contain different mental symbols that are co-referential but count as type-distinct by the Relationist semantic theory. That way, the view raises no substantial worries about either cognitive access or naturalism.

The final issue in this section concerns the objective nature of propositions, that is, the status of propositions as objects. A major advantage of the current proposal is that it upholds the idea that propositions are objects, much like the classical account of propositions but in stark contrast the recent proposals of King and Soames. As a result, it does not commit what King aptly calls a category mistake (King 2012: 22). The recent literature on propositions is actually characterized by a rather odd dialectic in this respect. One philosopher objects to the proposal of another by pointing out that a serious category mistake has been committed only to propose an alternative that is just as objectionable. Soames, for instance, invokes the category mistake problem against the view that propositions are acts, which he presents for educational purposes (crediting it to Pryor), and which is a view actually defended by Hanks (2011). Soames asks:

> "[W]hy not take [propositions] to be act types?"
> (Soames 2010d: 99)

And his answer is:

> "Whereas it is perfectly coherent to say that predicating brilliance of John is what I just did, or that the proposition that John is brilliant is false, it would be incoherent to say "*The proposition that John is brilliant is what I just did," or "*What I plan to do (when I plan to predicate brilliance of John) is false."
> (Soames 2010d: 100)

Soames points to the core of the category mistake problem. While propositions are true or false, acts are not. And while acts are something one performs, propositions are not. This indicates that propositions belong to a different ontological category than acts, which entails that propositions are not acts. While convincing, it is surprising that Soames then proposes a view on which exactly the same problem arises. On his view, propositions are predication event types. However, events intuitively happen or take place, but propositions do not. It makes no sense to say that the proposition that Obama won the election just happened or took place. Soames thus faces the same category mistake problem. King agrees:

> "[E]vidence [...] suggests that the event types that Soames identifies with propositions are not propositions. [...] we should be able to talk about the event type using the expression 'what just happened.' I say 'What just happened was proved by Gödel.' Again, this is incoherent and surely is a category mistake."
> (King 2012: 22)

King raises the same objection against the view that propositions are properties of worlds as well (2012: 15). As before, this shows persuasively that propositions are neither events nor properties. But then King proposes his own account on which propositions are facts. It is obvious, though, that the same worry will then also arise for King. Facts obtain, for instance, but propositions do

not. The fact that Obama is president obtains (at the time of writing), but the proposition that Obama is president does not, even if it is true, and what it states, namely that Obama won the (latest) election, is a fact. Moreover, propositions can evidently be false, and since they are facts on King's view, King is committed to the controversial existence of false facts. Hence, it appears that King commits the same kind of mistake that he attributes to others.

What lessons should be drawn from the fact that the envisaged proposals commit these category mistakes? The only plausible conclusion is that in order to truly avoid committing a category mistake, propositions should be considered semantic objects of some sort. Since the current proposal considers propositions to be complex mental objects, it avoids committing a category mistake. Moreover, the view also points to a plausible analysis of why and how the alternative proposals go wrong. For instance, while the tokening of a proposition is both an event and an act, the proposition so tokened is not. This suggests that the category mistake committed by event and act views arises because they obliterate the difference between the tokening of an object and the object so tokened. A similar point can be made about King's proposal. On the face of it, the facts he considers propositions are rather facts about languages expressing propositions. Hence, his view arguably commits a category mistake because it confuses propositions with the facts about them. Specifically, for King the proposition that Hesperus is a star is a fact which is partly constituted by the fact that there is linguistic expression of some language (viz. "Hesperus" in English) that in a certain context has Hesperus as its semantic value. But why should one think that this fact is part of the proposition, rather than being a fact about the proposition, namely a fact to the effect that the proposition contains a linguistic expression of some language that has Hesperus as its semantic value? In contrast to these recent proposals, the current view on which propositions are syntactically structured mental representations makes a clear distinction between propositions and the acts and events that are their tokenings, as well as between propositions and the facts that obtain about them and their content. As a result, it avoids the category mistake problem.

Before concluding this chapter, a final remark on a point King makes against the view that propositions are properties:

> "Properties, even properties of worlds like being such that snow is white, just don't seem to be things that are true or false. To say that they are true or false seems like some sort of category mistake"
> (King 2012: 15)

One may recall that on the current view content is considered a semantic property of propositions, which in turn are mental bearers of content. Does this mean that the current proposal also commits a category mistake by applying truth and falsity to properties? The answer is no. On the current proposal, semantic content is a property, but the proposition is not. However, it is the proposition, which is an object, that is true or false, and not its content. Hence, there is no category mistake of having true or false properties.

In conclusion, it is a very promising option in the theory of propositions to think that propositions are mental representations which are bearers of semantic content rather than structured content entities. The most important feature of this proposal is that it gives up the traditional identification of propositions with semantic content. It was shown, however, that this conception can still accommodate the roles commonly ascribed to propositions. Moreover, the view has substantial

advantages over alternative proposals. The most significant advantage over classical approaches is arguably that it can make sense of the representational nature of propositions. The most important advantage over the more recent proposals considered is that it retains the intuitive idea that propositions are objects. To the very least, this shows that the idea that propositions are mental representations deserves more attention than it currently receives in the philosophical literature.

Conclusion

The thesis supports three key conclusions. First of all, it is possible to uphold the Language of Thought based approach to the mind if one adopts a Relationist semantics as its theory of content. The principal reason is that only Semantic Relationism offers a notion of content adequate for the proper type-individuation of Language of Thought symbol tokens by providing a satisfactory solution to all the variants of Frege's Puzzle for the Language of Thought. Secondly, a Relationist semantics is ontologically most plausible and accessible if applied to the Language of Thought, as it allows for a convincing explanation of the way semantic coordination is ontologically grounded, which in turn accounts for crucial systematic differences between distinct types of coordination that are otherwise left unexplained by the semantic theory. Thirdly, the Language of Thought hypothesis combined with a Relationist semantics enables a convincing theory of propositions as sententially structured mental representations. While the Language of Thought provides the concrete sentence tokens identified with propositions, Semantic Relationism allows for the proper individuation of the sentence tokens into abstract proposition types. That way, the combination of the Language of Thought hypothesis with Semantic Relationism and a derivative theory of propositions as mental representations makes for a very promising theoretical framework within a cognitivist approach to the study of language and the mind.

What are the main consequences of the combined view? First of all, the thesis reestablishes the viability of the Language of Thought hypothesis as a theoretically sound basis for the study of the mind, the truth of which ultimately depends exclusively on the outcome of further empirical research in cognitive science. The major advantage of the hypothesis is that it allows for a promising explanation of the cognitive capacities and processes necessary to account for empirically observable phenomena such as linguistic communication and rational behavior, the ability to do which its connectionist rival still has to prove. Secondly, the thesis shows that with Semantic Relationism, it is possible to lay to rest Frege's Puzzle for the Language of Thought once and for all. If the hypothesis that beliefs are syntactically structured mental representations is also correct, then the proposed solution applies to Frege's Puzzle for belief in general, Kripke's variants of the Puzzle notably included. Moreover, if the further conjecture that the only object with semantic content is the Language of Thought is also correct, the proposed semantic theory actually solves Frege's Puzzle altogether. Thirdly, the thesis suggests that propositions are mental representation tokens and types with semantic content that is semantically speaking relational and ontologically speaking a property. Evidently, this has major implications for many areas of research where either propositions or the notion of content play an important role. A prima facie unexpected result is that mental content does not supervene on the intrinsic properties of individual minds, but instead depends partly on how minds are related to other minds by virtue of their involvement in linguistic communication.

As a fourth consequence, the thesis brings out how both propositions and semantic content fit into a naturalistic worldview, albeit an extended one that accepts semantic properties and relations as natural properties and relations. The result is a confirmation of the scientific acceptability of the various philosophical theories predicated on propositions and semantic content. Finally, the thesis amounts to an incompleteness prove for type-based descriptions, which includes descriptions on the basis of notions such as propositions, thoughts or beliefs. Given that such descriptions are based fundamentally on a transitive type-identity relation, which is not reflected in the actual semantic facts involving the tokens, such descriptions can only incompletely or inconsistently describe the entirety of semantic facts that are constitutive of empirical reality. So just as Gödel shows that there is no consistent system of axioms on the basis of which all truths of arithmetic can be proved, the upshot of the thesis is that no consistent abstract system making use of notions such as propositions, thoughts or beliefs is able to provide a consistent and complete description of linguistic reality, assuming, as is plausible, that it contains at least one instance of a semantically faultless transitivity failure. Another useful analogy in this regard is the biological case of grounding the notion of a species in the capacity to interbreed, which likewise entails that no consistent and complete description of biological reality in terms of species is possible if there is at least one instance in which the ability to interbreed fails to be transitive. In addition, the thesis also highlights that this fact strongly suggests a nominalist approach to semantic objects such as concept and proposition types, which renders them essentially made-made explanatory devices similar to the concept of a species in biology.

How have these conclusions been reached in the thesis? The first chapter establishes that while there are historical predecessors to Fine's Semantic Relationism in the form of semantic theories with Relationist ideas, as well as contemporary views with a congenial approach, no such theory is as convincing, comprehensive and theoretically well-elaborated as Fine's, which is why it is best suited for the task at hand. The second chapter shows how and why Semantic Relationism is a very plausible two-tier semantic theory about the content of referential expressions, especially in the amended version adopted in the thesis. The third chapter focuses on the mind rather than semantic theory to demonstrate that the Language of Thought hypothesis, properly understood, is an explanatorily powerful theory about the mind with explanatory advantages over its main theoretical rival, connectionism. The main result of the fourth chapter is that by reason of the crucial difference between beliefs and their ascriptions, pragmatic solutions to Frege's Puzzle for belief fail, which leaves only semantic and syntactic solutions to solve the Puzzle on the Language of Thought hypothesis. The fifth chapter shows that no alternative semantic theory currently available in the literature is able to solve all the variants of Frege's Puzzle for the Language of Thought, which Puzzle is at the same time a problem about the proper type-individuation of Language of Thought symbol tokens. The sixth chapter establishes that Semantic Relationism, in contrast, provides a notion of semantic content that is adequate to solve all variants of Frege's Puzzle for the Language of Thought. Finally, the seventh chapter substantiates the claim that propositions, which play a crucial role in philosophical research and beyond, are syntactically structured mental representations that exist in two ontological varieties, namely concrete Language of Thought sentence tokens and abstract types individuated by their semantic content.

Evidently, many open questions for further research remain in all three domains broached in the thesis. In terms of the Language of Thought hypothesis, the most important outstanding issue is

whether a connectionist alternative can be developed that is explanatorily powerful enough to call into question the fundamental tenet of the Language of Thought hypothesis that mental processes are symbolic. If so, this inevitably means that the theoretical role of Semantic Relationism, and semantic theory more generally, has to be reassessed, with a view to determining whether semantic theories still play an important theoretical role and whether it is necessary and indeed possible to modify the theories for the application in a connectionist framework. A related issue is the impact a Relationist approach to the theory of content has for the potential of a symbolic system of mental representations to explain other mental capacities, for instance vision. The fundamental issue is whether theories of mental content in other mental domains can and should be considered Relationist as well, and what the potential implications for current research in these areas would be in that case. Prima facie, the intuitive answer is negative, as it is plausible to assume that the necessity of a second and relational tier of semantic content for mental representations is due essentially to the explicit involvement of those representations in linguistic communication, which is inexistent in the case of the representations that underlie non-linguistic mental capacities such as vision. However, it is clear that further research is required to settle the issue definitively.

A crucial question that remains open in terms of semantic theory pertains to the theoretical and ontological implications of the idea that semantic content is not an entity but a property. This raises issues, for instance, about the ontological status of relational semantic properties, such as the property of referring to an object or the property of being coordinated with another expression, which are intuitively derivative rather than fundamental properties. This in turn brings up ontological concerns about relational properties more generally. Another subject in semantic theory that warrants further research is the conjecture, mentioned occasionally in the thesis, that predicates are expressions that refer to properties. If correct, Frege's Puzzle will arise for predicates in exactly the same way as for proper names, but the proposed Relationist solution will also be available. In this connection, questions about the semantic content of non-referential expressions have to addressed as well, specifically whether these expressions also have a two-tier semantic content and if so, what the tiers consist of. These and many similar issues in fact arise in the philosophy of language and the philosophy of mind within a cognitivist framework in the context of the wider implications of a Relationist approach to semantic theory.

Finally, it is clear that issues for further inquiry also arise for the proposal that propositions are mental representations. The most important question in this regard is the ontological status of concepts and proposition as types, which is evidently only one aspect of a much broader concern with the ontological status of abstract types. That concern is in turn only one aspect of a larger dispute between Platonist and Nominalist approaches to the abstract objects posited in scientific theories, which includes propositions, but also natural language expression types, sets or numbers. A further open question of great interest is the implication of the advocated theory of propositions for the idea that logic is the study of notions that apply to propositions which are crucial for correct reasoning, such as inference and validity. A particularly interesting issue in this context is whether propositions as abstract mental representation types are sufficiently mind-independent, unlike their mental tokens, to satisfy Frege's well-known dictum that logic is not concerned with study of concrete mental processes. A more general question this brings out is whether the Nominalist approach to propositions tentatively endorsed in the thesis is compatible with the role abstract propositions have in fields not directly related to cognition, such as logic and mathematics.

There is thus clearly no shortage of open questions for further philosophical research into language and the mind. Even so, the thesis provides a solid Relationist foundation to address such questions, which are in fact part of the further inquiry into the mind that is necessary for a deeper scientific understanding of the nature and content of thought in a cognitivist framework.

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